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GLOBAL CLIMATE CHANGE: ADEQUACY OF THE NATIONAL ACTION PLAN

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Global Climate Change: Adequacy of...

ARING

BEFORE THE

SUBCOMMITTEE ON
ECONOMIC POLICY, TRADE AND ENVIRONMENT

OF THE

COMMITTEE ON FOREIGN AFFAIRS
HOUSE OF REPRESENTATIVES

ONE HUNDRED THIRD CONGRESS

FIRST SESSION

MARCH 1, 1993

Printed for the use of the Committee on Foreign Affairs

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GLOBAL CLIMATE CHANGE: ADEQUACY OF THE NATIONAL ACTION PLAN

MONDAY, MARCH 1, 1993

House of Representatives,
Committee on Foreign Affairs,
Subcommittee on International Economic Policy,
Trade and Environment,
Washington, DC.

The subcommittee met, pursuant to call, at 1:30 p.m. in room 2172, Rayburn House Office Building, Hon. Sam Gejdenson (chairman of the subcommittee) presiding.

Mr. Gejdenson. The Subcommittee on Economic Policy, Trade and Environment meets today to discuss global climate change. Today's hearing is the first hearing of this subcommittee focusing solely on environmental matters, which were recently added to the subcommittee's jurisdiction. We intend to exercise this jurisdiction intensively.

For 12 years, Congress faced two administrations whose commitment to protecting either America's environment or the world environment was questionable at best. With the election of President Clinton, we now have an administration committed to environmental protection and to living up to our national interest in being environmentally responsible.

This sea change in the international environmental policy could not come at a more critical time. Scientists have demonstrated that the emissions of carbon dioxide and other greenhouse gases, together with the destruction of the world's forests, are warming the Earth's atmosphere. If this trend continues, sea levels may rise, agricultural patterns may change, and the world's energy, transportation and water supply systems could be endangered.

As the Clinton administration gets under way, they unfortunately will be faced with a clean-up task related to global climate left over from President Bush. In the last days of the previous administration, the State Department, over the objections of the Environmental Protection Agency, transmitted a National Action Plan for Global Climate Change to the other nations of the world. This plan was designed to fulfill U.S. commitments under the U.N. Framework Convention on Climate Change and was signed last June by 157 nations at the Earth Summit in Rio de Janeiro. The public comment period on the plan will end March 8.

As envisioned by the drafters of the Climate Change Convention, each country's action plan would not only delineate the sources of greenhouse gas emissions within the Nation's borders; it would also outline an aggressive policy and program to reduce greenhouse gas emissions, as well as to protect the world's forests, which absorb carbon emissions.

The Bush administration's plan, however, is a great disappointment. The plan is simply a restatement of government initiatives already under way to stabilize and reduce greenhouse gas emissions. It does not require the U.S. Government to take any new initiatives. Furthermore, the emission reductions which will be achieved by the National Action Plan do not even stabilize U.S. greenhouse gases at the 1990 levels, which was called for under the Convention.

The Clinton administration has an opportunity to revise the National Action Plan and to demonstrate to the world that the United States will not shy away from its international environmental commitment and responsibility. The purpose of today's hearing is not only to examine the shortcomings of the previous administration's plan, but to discuss the options available to President Clinton in redrafting a plan to better meet U.S. commitments under the Climate Change Convention.

I believe the United States should submit a revised National Action Plan which makes three basic changes over the existing document.

First, the United States should commit itself to reduce greenhouse gas emissions below 1990 levels. Specific timetables and targets for U.S. reductions will force us to craft aggressive and effective global warming policies.

Second, the administration should spell out how U.S. programs which reduce greenhouse emissions will be improved. While we are currently in an era of fiscal restraint, the government can better use existing resources to promote energy efficiency and alternative fuels, to increase protection of our forests, and to pursue research and development into solutions to global warming.

Third, the Clinton administration must specify how U.S. efforts to reduce greenhouse gas emissions will be coordinated. Currently, many different U.S. Government agencies, from the Environmental Protection Agency to the State Department, play a role in crafting and implementing U.S. global warming policy. We can get more bang from our buck if we eliminate the duplication and increase cooperation.

By submitting the National Action Plan after President Bush's election defeat, the administration—the Bush administration may have been trying to lock in U.S. policy on global climate change. They were clearly harboring false hopes. I am confident that the new administration, the Clinton administration, will see the National Action Plan for what it is: the first opportunity for the new administration to enunciate a far-reaching and ambitious U.S. policy to battle global warming.

I look forward to hearing from today's witnesses and working closely with the administration in months to come.

My colleague, Mr. Roth.

Mr. ROTH. Mr. Chairman, thank you for your opening statement. Let me say that I would like to join you in welcoming our witnesses today.

Few environmental issues generate more widely diverse views than global warming. Some believe we are on the road to inevitable catastrophe. Others deny it is happening at all. Very little has been proven by either side.

Like most people, I am concerned by what I read about global warming, but I am also concerned that the most radical approaches also would cause serious economic dislocation. It is going to be very hard to sell global warming to a worker whose job is being done away with because environmental rules close a plant or force a business overseas. That is why I am delighted to have the National Association of Manufacturers testify today.

Everyone says we need a balance between environmental and economic concerns, and that is what the Bush administration did in its proposed plan. And before the new administration tries to rewrite the Bush plan, it should remember that spending billions on economic stimulus can be canceled by strangling American business with more government regulations.

After all, the first country to implement the plan was what country? It was the United States of America. Other governments have talked about it, but we were the first to implement it.

There is a Wisconsin adage, talk is cheap; it costs money to produce milk; and that is the way it is with regulations. Let's remember, no country has done more on the environment than the United States. As our witnesses testify today, I hope they will address the danger of stalling our economy and hurting our competitive negatives.

Thank you, Mr. Chairman.

Mr. BALLENGER. Thank, Mr. Chairman. First, left me thank you for holding the hearing today. Global climate change is an issue that has been in the public eye for several years now, and the policy implications for action to control global warming are far-reaching, including areas of the business community. But there is a real simple answer to this whole question: If we will all just hold our breath, the problem is solved.

Mr. Chairman, I am somewhat concerned about the makeup of today's panel. Although you have included members from the business community, I believe that the panel is pretty one-sided in that it does not include persons opposed to the conventional wisdom on global climate change.

There are currently several scientists who believe that statistics on global warming are more hype than substance. It is my understanding that the subcommittee intends to hold another hearing on this issue in the near future. I hope the subcommittee will act to hold this hearing and not only—and not be only offering the Republicans' rhetoric to keep us from complaining about this very unbalanced panel.

In addition, I would ask that the subcommittee keep the record of the hearing open for an additional 2 weeks to include the testimony of Professor Patrick Michaels of the University of Virginia. Professor Michaels is widely respected as an expert who refutes the conventional wisdom on climate change, and I believe his statement will offer the subcommittee the kind of balance that we need to fully understand the magnitude of the climate change problem.

Mr. Chairman, I look forward to today's witnesses testimony, and I look forward to our second hearing on this same topic. Thank you, Mr. Chairman.

Mr. GEJDENSON. Thank you. We did ask representatives of an organization called the Climate Council, which represents a large portion of the coal and rail industries, if they wanted to come and have a witness testify. They declined. So we are always happy to get additional recommendations for witnesses.

What we would like to do is—if it is all right with everyone's time—is have all of you make your opening statements. Your entire statements will be placed in the record and, without objection, the record will be kept open for 2 weeks. Summarize the most salient points of your comments, and then maybe we can get a fight going between the four of you. If not, we will sit back and ask some questions.

Let me introduce the panel in the order they will be speaking: Dan Lashof, senior project scientist, Air and Energy Program, National Resources Defense Council; T.J. Glauthier, director, Energy and Climate Change Policy, World Wildlife Fund; Irving Mintzer, Center for Global Change, University of Maryland and Stockholm Environment Institute; John Hemphill, executive director, Business Council For A Sustainable Energy Future; and Michael Barrody, senior vice president of policy communications, National Association of Manufacturers and chairman of the Global Climate Coalition.

Mr. GEJDENSON. So if we can start with Mr. Lashof, you may proceed.

STATEMENT OF DANIEL LASHOF, SENIOR PROJECT SCIENTIST, AIR AND ENERGY PROGRAM, NATURAL RESOURCES DEFENSE COUNCIL

Mr. LASHOF. Thank, Mr. Chairman, Members of the committee. My name is Daniel Lashof. I am a Senior Scientist with the Natural Resources Defense Council.

In summarizing my written testimony, I would like to focus on specific recommendations for improving and rewriting the Bush administration's National Action Plan to produce an acceptable plan to deal with the problem of global warming. But before turning to that, let me say a few words about the scientific basis for taking action on global warming.

My written statement quotes at length from a summary of the science prepared by the Bush administration, and while we strongly disagree with the climate policies of that administration, I do believe that they presented a fair assessment of the science. The problem with the Bush administration was that they failed to act on their own assessment of the science, and so I would commend members of the committee to that summary of the science on global warming, which does, I believe, represent, as it states, the view of the vast majority of the climate scientists on global warming.

The critical link between science and policy is now found in the objective of the climate treaty itself, which the United States is now a party to. That objective is, and I quote, "the stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system." It further states that "such a level should be achieved within a timeframe sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened, and to enable economic development to proceed in a sustainable manner."

While significant uncertainties about global warming remain, it is clear that we can only ensure that this objective is achieved if the United States and other industrialized countries move rapidly to cap emissions at 1990 levels by the year 2000 and subsequently reduce them 25 percent by 2005, and details of how I have arrived at that conclusion are in my written statement.

At this point, I would like to move on to the specific recommendations about how to move forward with an effective National Action Plan.

NRDC believes that the National Action Plan released by the Bush administration fails to meet U.S. commitments under the Climate Convention in at least two key respects. First, the Bush administration NAP does not demonstrate an aim of returning emissions of greenhouse gases to 1990 levels as required by Article 4; and second, it was not prepared with public participation as required under Article 6.

I would note that, of course, the United States is not technically in violation of the treaty at this point in time because the treaty has not entered into force; but if it had entered into force and if the existing action plan was supposed to comply with the treaty, we would believe that it does not.

There are many technical problems with the existing action plan that are mentioned in my testimony that will be detailed in public comments, but the most important failing of the Bush administration plan is that the mitigation section does not provide a plan for capping and then reducing greenhouse gas emissions. Instead, it provides a mixture of existing and planned programs, some of which include projected emission reductions while others do not.

Glaringly absent are energy taxes and policies to reduce emissions from the transportation sector, in particular, through automobile efficiency improvements. Moreover, there is no specific plan of action that must be taken by government agencies and the private sector in order to achieve those emission reductions that are specified.

Drawing on the public comments, the administration now should revise the National Action Plan using the following general guidelines: First, the NAP should detail a credible plan for capping emissions of carbon dioxide and other greenhouse gases not controlled by the Montreal Protocol at 1990 levels by the year 2000, with subsequent emission reductions of 25 percent by 2005.

Second, the NAP should provide specific baseline and post-policy emission projections from 1990 through at least the year 2010.

Third, the NAP should include a specific implementation plan, including programmatic timetables and required budgets by agency.

And fourth, the NAP should include an evaluation procedure for regularly assessing whether the United States is on track to achieving its stated emission targets with provisions for adopting additional measures, for example, increasing energy tax rates, if emissions are higher than anticipated.

The most recent DOE/EIA reference case projection indicates that carbon dioxide emissions will increase by some 160 million metric tons of carbon by the year 2000 relative to 1990 levels. If properly implemented, many of the measures in the existing plan could significantly reduce greenhouse gas emissions from projected levels. In particular, EPA's voluntary public-private partnerships, such as Green Lights, Energy Star Computers and Golden Carrot Refrigerator programs, have been highly successful to date. These programs remain underfunded relative to what would be needed to achieve the market penetration targets in the current plan. If adequate funding is provided, the combination of EPA's program, effective implementation of the Energy Policy Act of 1992, and ongoing State-level and utility efficiency programs might reduce carbon dioxide emissions by the year 2000 by about 100 million metric tons of carbon based on the calculations in the existing plan. That leaves a gap of some 60 million metric tons of carbon that need to be made up.

In my testimony, I enumerate a number of policies that complement or augment those in the existing National Action Plan. Estimated emission reductions are given for the year 2000, and they come to a total of some 80 to 110 million metric tons of carbon, assuming that the individual programs are additive. These emission reductions come from measures—including the Btu tax, included in the Clinton-Gore economic package—increasing automobile fuel efficiency standards and measures to internalize the cost of driving automobiles and therefore reduce the use of single-occupancy vehicles where other modes of transportation are available, measures to increase the efficiency of Federal buildings and residential buildings, as well as measures to promote renewable energy and natural gas to replace higher carbon fuels.

These policies, taken together with the existing measures in the plan, would allow emissions to be reduced by some 180 to 210 million metric tons of carbon, more than enough to achieve the goal of reducing emissions below 1990 levels by the year 2000; and the impact of most of these programs would increase in future years beyond 2000, yielding significant emission reductions.

The importance of timing cannot be overstressed, however. Much valuable time has already been lost since the 1988 Toronto Conference first called for a 20 percent reduction in emissions. The turn of the century is now only 7 years off. Each program outlined here will take some time to get off the ground and additional time to achieve significant emission reductions as equipment turns over. The administration and Congress must move quickly to adopt and implement a real National Action Plan to arrest global warming.

Thank you.

[The prepared statement of Mr. Lashof appears in the appendix.]

STATEMENT OF T.J. GLAUTHIER, DIRECTOR, ENERGY AND CLIMATE CHANGE POLICY, WORLD WILDLIFE FUND

Mr. GLAUTHIER. Mr. Chairman, I am T.J. Glauthier, director of Energy and Climate Change Policy at the World Wildlife Fund. I also coordinate the policy work of WWF organizations throughout the world on energy and technology transfer issues.

WWF is the U.S. affiliate of the international WWF family, which is the world's largest private conservation organization. We have over 1.2 million members here in the United States and over

4 million members worldwide. We have national organizations or representatives in nearly 40 countries around the world.

I also wish to acknowledge our identification with the Climate Action Network, which is a coalition of nongovernmental organizations working on climate change here in the United States and internationally. While I can't speak specifically for all the members of this coalition, I think, together with the comments of my colleagues, Mr. Lashof and Dr. Mintzer, you will get a sense of the general reaction of the nongovernmental organization community regarding the U.S. Action Plan.

I will summarize my comments. The testimony is submitted to you in its entirety.

The subcommittee did raise a question of whether or not the draft action plan should be revised or completely scrapped. This question is largely a matter of semantics. In either case, the thinking and the public comment that has gone on is relevant and should be used in moving forward; and the draft material certainly contains some sections, such as descriptions of key program elements and research plans, that will be useful. However, the revisions that are needed to the overall plan are so extensive that the final version should be substantially different from the draft.

I have four key recommendations I would like to make: The first one is that the draft plan needs a 180-degree shift in orientation to become a strategic document that sets goals and drives actions within the administration.

As you have heard from Dr. Lashof, the draft plan is not goal directed. It is just a compendium of programs and actions that are being undertaken for other reasons.

This plan should be a strategic document. It should be the statement of strategy for our Nation's climate action program. As such, it needs to set forth goals, priorities, and program directions that are useful on a day-to-day basis in making research, policy, and resource decisions.

Our final plan should embrace the objective of the convention and make a clear, explicit commitment to meeting the target of returning greenhouse gas emissions to their 1990 levels by the year 2000. Then the body of the document should spell out in detail our strategy for achieving that. Our plan should also include a commitment to monitoring our progress and adding additional measures to the plan or increasing their pace if subsequent information shows that the actions we have laid out are not adequate to meet the year 2000 target.

In making the plan a goal-driven document, we also recommend a substantial amount of restructuring being done. I will leave the details of that to later comments.

Our second recommendation is that the action plan needs more actions. The current draft does not meet the test of a good-faith plan because it does not achieve the emissions reduction goal of the treaty. In fact, using the numbers in the draft, it is possible that the steps in the action plan will only go halfway toward the goal of returning emissions to the 1990 levels by the year 2000.

In addition, I understand that a number of the technical assumptions underlying these calculations are based on a rosy scenario and may overstate the emission reduction that will actually be achieved by the listed actions in the plan.

Currently, what is needed is a credible package of programs and actions, that technical experts agree will be such, to achieve our national goal under the treaty. That will require adding more measures now and including the commitment to monitor results and add additional measures later, if needed.

A third recommendation regards the technology transfer section of the draft plan. That too needs to be changed to be strategic. It needs to contain specific goals that will drive the program and actions to assist the U.S. private sector in undertaking projects abroad.

The present draft on technology transfer lacks both goals and any statement of strategy. At this point, it contains just a listing of examples of activities that fall within this sphere but without direction. The entire treatment of one key area, for example, technology development and transfer, consists of a one-sentence introduction followed by 22 bullets of examples of U.S. projects. These may be valuable sound projects; however, there is no attempt to provide an overall perspective, set of goals, and strategy that binds these together.

Our technology transfer program must be based on facilitating actions by hundreds or thousands of firms in the private sector. We can do that by providing a vision, setting goals, creating incentives, removing barriers and facilitating private sector action.

Some specific recommendations: The United States should set an ambitious, specific goal, such as having 1,000 private-sector projects under way by 1996 in developing countries and countries whose economies are in transition. One thousand projects would provide real focus for government officials who are implementing this program. It would tend to concentrate their attention on real, concrete actions that would stimulate private-sector activity, and the number of projects should be high, high enough to be a worthy goal, but even at this level, it amounts to only two projects per year for each of the next 4 years for each of the developing countries or transitional countries that sign the treaty.

Another recommendation is that the administration should integrate the Action Plan goals and objectives into whatever reorganization is developed for the AID program.

Another is that the United States should actively seek and support meaningful changes to the Global Environmental Facility, which is the interim financing mechanism for technology assistance to developing countries under this treaty.

And finally, the administration should work actively to improve incentives and remove barriers to technology transfer, and effective international private sector partnerships.

Assistance programs could be modified to provide seed money to establish “energy efficiency trust funds” in developing countries. Such monies could be used as revolving funds to overcome the high initial cost barrier of efficient technologies, and the earnings could support continued local staff capability. That idea comes from our experience in conservation finance, specifically in the debt-for-nature swaps. It has shown that the single greatest determinant long-term success is securing funding to support local, independent staff to facilitate and oversee projects on a long-term basis.

My fourth and finally major recommendation is that we should put the Action Plan on a "fast track," commit to publish it by August 1993, and call on other developed countries to do likewise. The plan should be the pacing activity for our national program to deal with global warming, so we need it soon. Furthermore, the United States has an opportunity now to accelerate other countries' implementation activities by several months, or even as much as a year, but only if we commit ourselves in the next few weeks.

In closing, I will reiterate that the overall recommendation we have: that the U.S. National Action Plan must be revised to be a strategic blueprint for U.S. actions to combat global climate change, and it is needed soon. Thank you.

[The prepared statement of Mr. Glauthier appears in the appendix.]

Mr. GEJDENSEN. Mr. Mintzer, are you ready?

Mr. MINTZER. Sure.

Mr. GEJDENSON. If would you rather take a moment, we can let Mr. Hemphill proceed.

Mr. MINTZER. I would actually rather take a moment.

STATEMENT OF JOHN HEMPHILL, EXECUTIVE DIRECTOR, BUSINESS COUNCIL FOR A SUSTAINABLE ENERGY FUTURE

Mr. HEMPHILL. Thank you. My name is John Hemphill. I am executive director of the Business Council for a Sustainable Energy Future, and I would like to thank you for having me come to represent the Business Council before your subcommittee on this important issue.

Just briefly, let me give you a little background on the Business Council. It is a fairly new organization; we were formed late last year. We are made up of business leaders from the energy efficiency, renewable, natural gas and utility industries that share a common commitment to a comprehensive, forward-looking, technology-based vision of the future use of energy in meeting the nations' economic needs.

Today, we are here to talk about the draft National Action Plan. We have about four or five comments that I will briefly touch on. I will just simply summarize our full comments, that have been submitted in writing to the subcommittee.

First, we believe that the National Action Plan would be more effective if the document examined the impact of future greenhouse emission programs and not focus only on those programs that are currently in place. This suggestion is not anything new. Other witnesses have made this same observation—that the plan needs to be more strategic.

Mr. GEJDENSON. It might be helpful if you pull that mike just a little bit closer. Some us up here are old and hard of hearing.

Mr. HEMPHILL. For example, we believe the plan should focus on reprioritization of the Federal R&D budget with an emphasis toward increasing the level of funding for renewable energy, energy efficiency and natural gas and those kinds of technologies that promise to be a solution for the future.

Second, we believe that the solution to global climate warming can be dealt with in a very economical and efficient way. It doesn't require loss of jobs and major dislocations. In fact, we believe that solutions to global warming can also provide a net plus in those areas. In fact, a study called An Alternate Energy Future, sponsored by the Alliance to Save Energy, the American Gas Association, and the Solar Energy Industries Association, shows that aggressive deployment of these technologies could reduce CO_2 emissions by the year 2000 by 10 percent, compared to 1990. But to achieve this result, the plan would have to include actions in the transportation sector.

This brings me to my third point. The current plan virtually ignores the transportation sector of our economy. The transportation sector accounts for 27 percent of our primary energy use, of which virtually all is petroleum. We believe that the revised plan needs to include actions in this area. Those actions could include expanded use of alternate fuel vehicles, increased vehicle efficiency standards, and improved mass transit systems.

Fourth, we believe that the plan put too much emphasis on adaptive strategies rather than on mitigation strategies. Preventative measures that make both economic and environmental sense, taken now, we believe will be less costly and more sustainable than adaptive measures taken in the future. Unfortunately, we don't think the plan provides a balance in that regard. We think greater emphasis on global climate change mitigation would better underscore the country's commitment to address this issue.

Fifth, the Business Council recognizes that increased energy efficiency will be the foundation for a sustainable energy future. The current version of the National Action Plan recognizes the importance of energy efficiency, but we are concerned that it fails to recognize the importance of achieving greater efficiency over the full cycle of energy use. It is essential to consider the emissions from the point of extraction to end-use. Considering only end-use efficiencies could produce mistaken results. It is critical we think, that the energy molecules be traced from the mine mouth to the point of consumption and that emissions also be counted from beginning to end.

And finally, we think that the Action Plan needs to look at joint implementation opportunities with other countries. We believe that there are actions, especially in Eastern European and in developing countries, where the government, working in partnership with businesses, could develop joint programs for exploiting U.S. products and technologies to aid in the solution, the global solution to this problem.

I will conclude by stating that the Business Council stands ready to work with government to achieve this end. Thank you.

Mr. GEJDENSON. Thank you.

[The prepared statement of Mr. Hemphill appears in the appendix.]

Mr. Barrody, now we will let you clean up. That is what this is all about.

STATEMENT OF MICHAEL BARRODY, SENIOR VICE PRESIDENT OF POLICY AND COMMUNICATIONS, NATIONAL ASSOCIATION OF MANUFACTURERS, AND CHAIRMAN, GLOBAL CLIMATE COALITION

Mr. BARRODY. Thank you, Mr. Chairman.

In response to the opening discussion between the Members of this committee, I would like to say that I am here primarily in my role as chairman of the Global Climate Coalition, and attached to my written testimony are the members of that coalition. And we are here, I suppose, to make sure that what is developing as the common wisdom of this presentation doesn't take hold unchallenged.

We take a different view of the National Action Plan than you have heard from the witnesses so far, and I would like to take just a couple minutes, if I may—maybe more than a couple—explaining why that is the case.

The Global Climate Coalition believes that it is essential that the climate change issue be framed in the context of industrial competitiveness in the global economic environment. Ill-considered policy responses to issues such as climate change, especially those that adversely affect the competitiveness of our Nation's industries would ultimately hamstring our ability to respond to pressing energy and environmental challenges. So we are pleased to provide our comments on the National Action Plan.

In December 1991 at the fourth session of the INC—the Intergovernmental Negotiating Committee for a Framework Convention on Climate Change in Geneva, Switzerland, the United States announced that it would put forward a national climate action plan for public consideration within 1 year of signing a climate convention. In concluding negotiations of the convention in its fifth session in New York in May of 1992, the INC announced a "prompt start" resolution addressing "Organizational Matters: Future Work."

When President Bush signed the convention itself at Rio last June, he announced that the United States would present a national climate change action plan by the end of the year, and proposed that countries meet by January of 1993 to present and review their plans.

This announcement was confirmed by the head of the U.S. delegation at Rio. The U.S. National Action Plan for Global Climate Change was then prepared prior to the INC session in Geneva last December and was communicated and discussed at that session.

At the same time it was communicated to the INC Secretariat, the National Action Plan was made available for public review and comment. The Global Climate Coalition plans to file detailed comments on the National Action Plan by the March 8 deadline next week.

Furthermore, the United States, we believe, is not obligated under the Convention to communicate any reports until 6 months after the treaty enters into force. The format for this and other formal communications will be considered by the INC as part of the preparation for the first session of the Conference of the Parties.

Certainly, the National Action Plan could be modified at some future date, but there is no obligation to do so until 6 months after the Convention enters into force and the INC has specified the format for communication required under Articles 4 and 12. As of February 8, only 11 countries had ratified the Convention; 39 more are needed before it enters into force, and that is not expected to occur until perhaps the end of this year or, more likely, 1994.

At that time, the National Action Plan could be changed to reflect policies and measures then being taken by the United States to reduce greenhouse gas emissions.

In view of the Convention timetable and the desirability of allowing the Energy Policy Act and other laws and initiatives to be implemented, there is neither an obligation nor a compelling reason for the administration to restructure the Action Plan at this time. However, the action plan could be updated to reflect changes in U.S. laws and policies, as I will explain in a moment.

Despite the enactment of the Energy Policy Act in October last year, the National Action Plan in December 1992 did not attempt to reflect the full implications of the new law. Granted, the act incorporates to a large extent the programs of the National Energy Strategy which began to be implemented in 1991, and some of the numbers for the strategy are subsumed in the act. However, there was no systematic attempt made in the National Action Plan to adjust the numbers specifically to reflect the effects of the new law.

It should be clear that the implementation of the act will have a significant impact on greenhouse gas emissions in the years and decades ahead. There are notably 14 titles of the national Energy Policy Act that relate to global climate change, 11 of them identified in the Action Plan.

The Action Plan notes a number of other laws that should serve to reduce greenhouse gas emissions. The impacts of these laws on reducing such emissions do not appear to be taken into consideration and otherwise discussed in any detail in the Action Plan, for example, the Clean Air Act Amendments of 1990.

Other government initiatives, primarily in the carbon uptake or sequestration area should also offset carbon emissions and should be considered in the calculation of net emissions. Title XVI of the Energy Policy Act, the so-called "global climate title," sets forth a twofold approach to the global climate change issue: Number one, voluntary actions for emission reductions should be encouraged; and, two, the government should analyze the important technical and policy issues that will enable the United States to make wiser decisions on more dramatic and possibly higher-cost actions which should only be undertaken in the context of concerted international action.

Section 1605 lists a number of emission reduction and carbon fixation measures that companies can undertake voluntarily: fuel switching, forest management practices, tree planting, use of renewables, manufacture or use of vehicles with reduced greenhouse gas emissions, appliance efficiency standards, methane recovery, cogeneration, capture and recovery of CFC's and power plant heat rate improvement. This is a list of voluntary actions that is by no meanings exhaustive.

EPA has been pursuing a number of voluntary approaches. Its Green Lights and Energy Star Computers programs are well documented. These programs are generally characterized in the Action Plan as "market pull" programs, where mass-purchase initiatives and industry program coordination aimed at new technologies can help get products off the drawing board and into the marketplace. The act also encourages Federal voluntary incentives programs in the section 1604 study provision.

We believe that the National Action Plan should include several key concepts. The Global Climate Coalition supports a flexible, balanced, comprehensive, and international approach in responding to concerns related to the global climate change issue. Such an approach should be based on cost-effective, scientifically sound policies that are independently justifiable on their own grounds.

Moreover, both internationally and nationally, governments should further enhance scientific and economic research to help resolve the remaining uncertainties of global climate issues. As summarized in the 1990 First Assessment Report of the Intergovernmental Panel on Climate Change, these major uncertainties still include the magnitude, the timing, rate and regional impacts of potential climate change. They also include the effectiveness of specific response options in actually averting potential climate change; and the costs, effects on economic growth and other socioeconomic implications of specific response options. Furthermore, there is time to resolve the major scientific and economic uncertainties before taking actions that go beyond those that are cost effective, scientifically sound, and independently justifiable on their own grounds.

Importantly, a comprehensive international approach to the global climate change issue is called for because greenhouse gas emissions are a global phenomenon and must be addressed by all countries. Rising levels of emissions from developing countries will soon exceed emissions from industrial countries. In the next century, the major emitters of greenhouse gases will be the emerging economies of the Commonwealth of Independent States and Eastern Europe, China, and centrally planned Asia and other developing countries. By the year 2050, these emerging economies will generate nearly 77 percent of the world's total anthropogenic greenhouse emissions. Thus, any administration action on the global climate change issue must take into account further negotiation of the INC and the work of the IPCC.

The Global Climate Coalition supports the longstanding position of the United States in the INC negotiations, which is based on a comprehensive approach to addressing all greenhouse gases and their net emissions, taking into account all sources and sinks, and flexible responses on a country-by-country basis. We do not believe that setting specific targets and timetables that specify emission reductions or caps for a specific greenhouse gas from a specific industry would be appropriate policy.

In addition, U.S. industry firmly believes that a crucial element, not only of any international agreement on global climate change, but also this country's response to that issue, must be technology cooperation in the international community.

The Global Climate Coalition has long supported a Technology Cooperation Corps initiative. This program, we believe, holds the potential for significant environmental benefits due to U.S. industry involvement in the efforts of developing countries to constrain the growth of their greenhouse gas emissions.

Finally, impacts on international competitiveness must be considered by the government in any debate on national policy options.

The National Action Plan has appropriately focused its attention on the policies and measures already under way in the United States to reduce greenhouse gas emissions. The reductions that will result from implementation of the Energy Policy Act and the Clean Air Act Amendments of 1990, as well as voluntary actions and other measures based on market conditions, should lead to economic efficiency and lower levels of emissions.

What the National Action Plan does not include is a detailed evaluation of the costs of these policies and measures and their impacts on the economy against the worst case—excuse me, against the base case. Such analyses are important to the American public.

The costs will have very real economic impacts. According to several recent studies, restricting greenhouse gas emissions to 1988 levels could by the year 2010 reduce Gross Domestic Product by 1.5 to 2 percent, cause the loss of half a million jobs, and increase the fuel prices of electricity by 50 to 60 percent in the industrial sector of the U.S. economy.

Mr. Chairman, that concludes my statement. Thank you.

Mr. GEJDENSON. Thank you.

[The prepared statement of Mr. Barrody appears in the appendix.]

Mr. Mintzer.

STATEMENT OF DR. IRVING M. MINTZER, CENTER FOR GLOBAL CHANGE, UNIVERSITY OF MARYLAND AND STOCKHOLM ENVIRONMENT INSTITUTE

Mr. MINTZER. Yes, thank you, Mr. Chairman. My name is Irving Mintzer, and I am a senior research scholar at the Center for Global Change at the University of Maryland. I currently sit—participate as a member of Working Group I of the IPCC on Science and Working Group III on Cross-cutting Issues, and have been participating for the last 2 years and was an invited observer in the deliberations of the Intergovernmental Negotiating Committee on Climate Change.

I fully agree with Mr. Barrody that consideration of the issue of global climate change of the National Action Plan needs to be framed in the context of considering its effects on the U.S. economy and, especially, on its effects on global competitiveness. But as I look at the data that is available to us now and the options that are open to us in the country, I draw a somewhat different conclusion. In my remarks to you today, I would like to focus on five specific issues.

First, do we know enough today to act wisely with respect to the risks of rapid climate change? Secondly, what are the implications of the remaining uncertainties, the nonlinearities in the climate system and the potential for surprises? Third, do we have the opportunity to buy any insurance against the potential damages associated with these risks? Fourth, can we revise the current original Bush administration National Action Plan and use it as a tool for planning for a stronger America? And finally, can we use the climate issue as a foundation for building new partnerships that will strengthen American business, that will return America to a position of leadership internationally and that will help to promote a sound environment for ourselves and our children?

To return to the first point, do we know enough to act wisely, as I am sure you have heard, during the last 5 years the risks of rapid climate change have received increasing attention among scientists, policymakers, responsible leaders in the business community, among members of the general public and nongovernmental organizations. Research on global environmental change, and on climate change in particular, has increased dramatically both in the United States and abroad. We now spend more than $1 billion on this research in global change and it has led to many important insights.

We know a lot about what is happening to the atmosphere and about what the implications of those changes are likely to be. The money we have invested in research here has produced models that are both complex, sophisticated and computationally intensive. Running on the largest supercomputers currently available, they give us a good idea of the main outlines of global climate change that could occur if the current trend of greenhouse gas buildup continues unchecked.

The Scientific Working Group of the IPPC has suggested that if current trends continue, we may see by the end of the next century a rise in temperature of as much as 2 to 5 degrees centigrade. That may not sound like much, but 1 degree centigrade is all that separates today's climate on average from the climate of the Little Ice Age when our friends in Scandinavia could walk on a cold day from Sweden to the continent; and 2 degrees centigrade, a warming of 2 degrees centigrade, takes us outside the range of anything that has been experienced in the last 10,000 years. A warming of 5 degrees centigrade from today's level takes us outside the range of anything experienced in the last million years.

That doesn't mean that human beings couldn't survive the change. Of course, some us would. It just means that we have no historical, cultural, or other written record that we could go back to and ask, OK, what did people do last time, what made the problem worse, what eased the transition, what reduced the dislocations?

But part of the reason that public attention is focused on the issue of rapid climate change is not so much concern about the effects of these gradual shifts in average global surface temperatures, for no one really lives in the average global climate. What has brought the concerns of the problems of the atmosphere has been an unusual sequence of extreme weather events, of instabilities, of the 100-year storm occurring twice in a decade in the Caribbean and again in Europe, of hurricanes in Florida, wind storms in the United Kingdom that ripped up trees many centuries old, of flooding in Arizona and storm surges in Bangladesh.

These extreme weather events and others like them have occurred without warning and on no particular schedule, as they have for millennia past, but the rapidly changing balance of upper atmospheric winds and ocean currents that is likely to result from a continued increase in greenhouse gases is probably going to lead to a period of continued instability and a change in the frequency and the distribution of these extreme weather events.

What our recent experience with Hurricane Andrew and the experience of others in both industrial and developing countries have taught us about these experiences is that, currently the institutions currently available to us are not well-positioned to respond to rapid changes in environmental conditions. Hurricane Andrew taught us that traditional American building practices, as sophisticated as they are, and traditional practices of building inspections, are not really sufficient to deal with extreme weather events like the 100-year hurricane. While the loss of human life was limited, Hurricane Andrew introduced over $5 billion of economic losses stressing school systems, water treatment facilities, and insurance companies across southern Florida.

Rapid climate change due to the enhanced greenhouse effect could increase the probability of these extreme weather events, adding significantly to the pressures on human societies and natural ecosystems that are likely to be under severe stress from other factors in the decades to come. No one can say with certainty that any of the specific weather anomalies we have observed recently have been caused by steadily increasing atmospheric concentration of greenhouse gases, but as the climate system moves toward a new, warmer equilibrium, we can expect that the turmoil caused by unsettled weather patterns will continue and even increase. Current scientific knowledge is insufficient to determine how, where, or when the effects of climate change will provoke additional experiences of extreme weather events in the future.

There are other uncertainties, as well, with which we must contest. We know that the climate that we experience is the result of a set of complex interactions from a set of coupled nonlinear systems, fluid dynamic systems of the ocean, the atmosphere, and their direction with the biota. We don't really understand the relationships with these systems, but we know by introducing greenhouse gases at the rates we are doing today, we are changing the driving force, the energy balance that links them together. We can only expect that, as a result, we will experience surprises in the way these systems respond.

Feedback mechanisms that we are only now beginning to understand indicate that we are likely to face thresholds of nonlinearity in the response of these systems, situations in which a small additional increment may provoke a much-larger-than-expected response in return.

But what can we do about these risks? Our position is similar to that of many parents in America with young children. They know that they and their children will be exposed to stress and disease in the environments in which they must live and work. They expect that at some unscheduled point, one or another member of the family will fall ill, but they cannot now know the timing or the severity of that future illness. They can ignore the possibility, since they don't know for sure that one or another of them will become sick, or they can take a few simple steps in advance to limit the risk. They can choose to strengthen the family with a healthy diet, abstinence from smoking, avoiding drugs, foregoing excessive use of alcohol and getting regular exercise; and to address the risks that cannot be avoided or minimized, they can invest in some basic insurance. A similar opportunity is available for our economy and for our country.

Although we cannot know what the effects of climate change due to the greenhouse effect will be on our economy or people, we can take steps to minimize the risk. We can increase the resilience of American society against the kinds of weather events we have seen in the past and may see in the future and we can strengthen our economy so that it is more robust and more capable and more competitive in dealing with a changing situation worldwide.

In order to do that, the first thing we have to do is to revise the National Inaction Plan for Climate Change and begin planning for a stronger America. The National Action Plan submitted by the Bush administration will not create new highways, jobs at home, and it will not demonstrate international leadership abroad. Although it does not violate the letter of the U.S. commitment under the Framework Commission on Climate Change, it clearly contravenes the intent of the treaty.

Reflecting what the country was already doing, absent concerns about climate change or our new obligations under the Framework Convention, the program proposed at the 11th hour by the Bush administration is indeed a plan for national inaction on climate. The Bush plan was a clear attempt to limit the options of the incoming Clinton administration and to preempt the role of the new administration in future negotiations on climate change. Introduced without congressional review and prior to public comment, it is but an unorganized collage of stale ideas and old programs, coddled together at the last minute without any underlying strategic direction or plan. It will not serve the country or the planet well.

The Bush plan precludes the United States from making a just and adequate contribution to the achievements of the objectives of the Convention as they are outlined in Article I of the Framework Convention on Climate Change. It does not assist the world in stabilizing the concentration of greenhouse gases in the atmosphere at a level which will avoid significant anthropogenic disruption of climate change.

Nevertheless, the National Action Plan is not wholly without merit nor should it be discard en bloc. It is a useful foundation, an indicator of what a business' usual strategy might look like if we had no concerns about the risks of rapid climate change. It ought well to be treated as an annex to a real National Action Plan, developed jointly by Congress and the administration and designed to strengthen the American economy while reinforcing traditional American values of commitment to market mechanisms of thrift, stewardship, and smart business sense.

To achieve the complementary goals of strengthening the economy and protecting the environment, the new Action Plan must embrace the spirit as well as the letter of the Convention signed at the Earth Summit. The United States must first make a firm commitment to stabilize emissions of carbon dioxide and other greenhouse gases at their 1990 level and then begin to reduce them from this level before the beginning of the new century.

To achieve these goals, making U.S. industry more competitive and the economy more energy efficient will take a dramatic assertion of U.S. leadership. The United States should reenter the climate negotiations prepared to move aggressively toward reducing domestic emissions while building the basis for new partnerships between U.S. firms and their counterparts in the private sector of developing countries, where the greatest new market opportunities are likely to exist.

Building on the basis of the President's economic plan, the United States must use market mechanisms to increase the economic efficiency of energy use at home. But to demonstrate the leadership that our friends and allies are now looking for from Washington, we must go further still. We must start here in this building and in the White House and the Pentagon by making a commitment to introduce a set of energy efficiency measures that would be designated by the Secretary of Energy on an annual basis as cost effective today and at the time of their designation, that these measures be required in all new leased or constructed space operated by and for the Federal Government.

We must reaffirm our faith in the American people by giving them true and complete information about the real price of energy. Ending the systematic deception of the American public about the price of energy, we must raise the price of gasoline to reflect the full economic and environmental costs of petroleum supply and use. I suggest, in addition to the President's plan, an additional gasoline tax starting at 4 cents per gallon and increasing 2 cents per gallon per month for the next 4 years. This should be complemented by a program to pay Americans to retire old, polluting vehicles in exchange for a cash payment from the government raised from the gasoline tax.

In addition, the program should institute an excise tax on cars and light trucks that achieve less than the Corporate Average Fuel Economy standard in the year of their manufacture. One approach would be to charge the purchaser a tax of $1,000—a user fee of $1,000 per mile per gallon below the standard of the first 10 miles per gallon; $2,000 per mile per gallon per vehicle for vehicles that fall between 11 and 20 miles per gallon below the standard; and $5,000 per mile per gallon for vehicles that fall between 21 and 40 miles below the CAFE standard. The money raised by this excise tax would be divided between the old-car bounty described above and a set of rebates for cars that achieve efficiency levels above the CAFE standard.

For example, vehicles that are 1 to 10 miles per gallon above the standard could receive $250 per mile per gallon, and those at 11 to 25 miles above the standard might receive $500 per mile per gallon. This type of "feebate" program was proposed by the Center for Global Change and adopted by the Maryland legislature, but struck down by the courts because it violated Federal laws.

We should change those Federal laws and use the market to encourage Americans to make good choices about the vehicles they use. You could still buy a 5-mile-per-gallon Lamborghini, but you would have to pay an extra $100,000 to do it. The gasoline tax should be supplemented——

Mr. GEJDENSON. What is the original price of the car?

Mr. MINTZER. You could probably pick one up for about 125.

The gasoline—and it would hardly throw any American automobile worker out of work. The gasoline tax should be supplemented by an increased tax on electricity that reflects the carbon content of the fuels used to generate it. The electricity tax should be made revenue neutral by the adoption of a set of tax credits for investments made by individuals or firms that increase the efficiency of energy use.

These sorts of actions at home will demonstrate to our allies and to our colleagues that we are serious about taking responsibility for our own emissions, but they are not enough. You have to move forward to build new partnerships for a stronger economy.

Energy supply and use is going to be one of the key investment sectors for developing countries with more than $100 billion of investment in the power sector alone, anticipated by the World Bank in the next 20 years. Even today, U.S. technology in many areas of renewable energy systems and energy efficiency improvements lead the world. Many developing countries, already desperately short of reliable energy, must expand both their supplies of energy and their efforts to increase energy efficiency in the coming decade.

To facilitate new partnerships in the energy sector, the U.S. National Action Plan should build on the recent successful experience on the part of USAID which has operated the PACER program, a program to support private—private partnerships in the acceleration of commercialization of energy research between U.S. firms and Indian firms over the last 3 years. This successful program creates a revolving fund that underwrites the risk capital necessary to stimulate joint ventures between American companies and their Indian counterparts.

Another important opportunity for promoting the goals of the Climate Convention and of the President's economic plan lies in a new drive to develop an international network of Centers of Excellence on Renewable Energy Systems and Energy Efficiency Technologies. This new network, modeled in part on the successful consultative group on international agricultural research, would be built out of existing institutions, mostly in developing countries, but with some industrial country participation as well. The network, with one institution in each region devoting accelerated market development of each major renewable energy technology, would support institutional strengthening and capacity-building in the developing world. The regional centers would act as a fulcrum and as an honest broker to promote new partnerships between American companies and their counterparts in the Third World.

The support of such a network is currently under consideration in the World Bank and USAID. These efforts should be encouraged by the committee and by the Congress as a whole.

Beyond the support of Regional Centers of Excellence to Promote Renewable Energy Systems and Energy Efficiency Technologies, the Clinton administration support a general change in the direction for mainstream lending in the World Bank and in the programs of the Global Environment Facility. In the case of the World Bank, the administration should press for greater emphasis on integrated resource planning and demand-side management in the energy sector. The United States should require that every new power sector alone devote at least 20 percent of the proceeds to measures to increase energy efficiency and otherwise limit the environmental impacts of energy supply and use.

In the case of the GEF, the new administration should push for a broad interpretation of the incremental cost clause of the Climate Convention, providing significant support for capacity-building activities in recipient countries. In general, the GEF should be urged to support development-oriented projects that have a significant benefit to the environment and not be limited to environmental projects that may have an incidental benefit for development. This orientation is necessary to assure the equitable distribution of the upcoming replenishment of the GEF and to maintain political momentum in negotiations of protocols for the Climate Convention.

Finally, the commitment of this administration to leadership on international economic development and the protection of the global environment should be demonstrated by a major speech to be offered by the President this spring to the U.N. General Assembly. The speech should cover not just the risks of rapid climate change but the full gamut of environmental issues that face the international community today. It should reaffirm the commitment made by the President during the fall campaign to stabilize U.S. emissions of carbon dioxide at the 1990 level, but it must go well beyond that easy step. It must position the United States as a world leader on the development of environmental technologies and the champion of those that would reduce environmental degradation in the world by promoting the status of women and eradicating poverty.

A wholehearted commitment by the United States to those goals will not only enhance our status, it will open up new markets for American businesses and help to save the global environment for our children.

In conclusion, the Clinton administration must meet the challenge of U.S. commitments to the Climate Convention by reworking the U.S. National Action Plan using the old plan as a base. The new plan should emphasize new and additional efforts in the United States to reduce our energy-related domestic emissions of greenhouse gases. It should outline specific programs for increasing resiliency of U.S. society to the types of weather and climate changes that might accompany a global warming due to the enhanced greenhouse effect.

In addition, the administration should move aggressively to promote new partnerships between U.S. firms and their counterparts in developing countries to accelerate the codevelopment and deployment of renewable energy technologies and energy efficiency devices. It should encourage a shift in the composition of lending and aid programs to stress the development of these technologies.

Perhaps most important, the administration must end the institutional deception of the American people, providing honest market signals about the real price of energy. If we can stop lying to the American people about energy by making the price of fuels reflect the full economic and environmental costs of energy supply and use, we can build our economy on the basis of a sustainable energy future.

This is the challenge of the risks of rapid climate change for the Clinton administration. If we can meet this challenge squarely today, we can build both a strong Nation and a clean environment. Thank you.

Mr. GEJDENSON. Thank you very much for your testimony. We thank all the members of the panel.

[The prepared statement of Mr. Mintzer appears in the appendix.]

Congresswoman McKinney.

Ms. MCKINNEY. Thank you, Mr. Chairman. I have a very basic three part question and it begins with the fact that many Americans don't have an opportunity to interact with scientists and learned professionals such as yourselves here, and instead have to rely on science lessons given by radio talk show hosts who hold that the Earth has wonderful self-corrective tendencies that negates the need for U.S. action in this area.

My question is, one, is the greenhouse effect real? And if so, then what is the one policy prescription most needed to correct the greenhouse effect?

The second question is, is not the CFC phaseout enough?

The third question is, is the policy prescription that you describe for the United States also suitable for Canada and Mexico?

And the question is for anyone who chooses to answer it.

Mr. GEJDENSON. We might just go down the row starting at either end. Why don't we start with Mr. Barrody, if he likes, first and then we will take each question, you can start at opposite ends. The people in the middle get the worst or the best of it. I am not sure which.

Mr. BARRODY. Does the chairman want me to take all three briefly?

Mr. GEJDENSON. Sure.

Mr. BARRODY. First, I should say, I am not here as scientist, but as a representative of the Global Climate Coalition which is an industry coalition. My understanding is that there is no doubt among scientists that the greenhouse effect itself, as a scientific phenomenon, is very real. It is what keeps and has always kept this planet livable. The real question is whether or not emissions into that—into the atmosphere are exaggerating that effect in a way that threatens us, and I think the real policy question is do we know enough at this point to be so sure of the peril that we would risk taking action unilaterally as the United States of America which would, one, not mitigate the peril because the problem is global by definition, and, two, by doing so, only serve to put the United States of America and the people in it at a competitive disadvantage.

So the real question is, how much of human action is responsible for any increased buildup of the concentrations in the environment and what effect may that have on climate. An awful lot of scientists will tell you that we simply don't know the answers to that and that we have the time to conduct the research to find out the answers to it, and in the meantime, such steps as are anticipated in the National Action Plan we have before us are sufficient steps and responsible steps, even leadership steps.

The CFC phaseout, is that enough?

No, because while CFC, as I understand it, is understood to be a greenhouse gas, as are all the ones we are talking about, it is only one of several, and it is being—those limits are undertaken for different reasons. And finally, is this policy prescription appropriate for our neighbors to the North and South?

Well, if I may, I think the question suggests the terribly, I think, overridingly important point I made in response to your first question. We must act on global climate considerations, globally. Even if we were not in doubt about the the appropriate policy steps for the United States to take and could enforce them on Canada and Mexico, and even if we were right, and that is a lot of ifs, the action of North America to restrain its own emissions would be overwhelmed in the immediate and long-term future by the actions of Europe and the developing countries in creating many more emissions than we would reduce by our own restraint.

Mr. HEMPHILL. Quickly to answer your question, it is my understanding that the greenhouse effect is real, that it is enough of a problem that just from a risk standpoint it should not, and cannot, be ignored, especially where there are, what we believe to be, cost-effective strategies to address the problem. Some have focused on the cost issue only.

I think one also needs to focus on the benefits, and I am talking about economic benefits as well as environmental benefits. We believe that there is a win/win possibility here, because we believe that there are many market opportunities both here in the United States and abroad. We believe there are cost-effective solutions to this problem.

With respect to the U.S. role, I think the United States has a leadership role; that if we don't show that we are serious, we can't expect our friends and neighbors to act, and I think that that leadership role is a very real and leadership is an effective means of assuring that other countries also participate.

Mr. MINTZER. As I think you have heard, there is a general consensus that the greenhouse effect is real, it is a natural phenomenon that is essential to the continued inhabitance of our planet. In the last century the greenhouse effect became the greenhouse problem because human emissions began to dwarf the ability of the planet to cleanse itself from the problems we produced. It is likely at continued rates of emissions, even if we stabilized emissions at the 1990 levels, the concentration of these gases also continue to rise and the risks of rapid climate change will thus continue to grow.

But there is a single, simple important step that we can take that is not unilateral, that puts us more into line with the actions of other EOCD countries and that will have the largest effect both on strengthening our economy and increasing our contribution to this problem. In the United States, we now sell gasoline at prices that are less than the cost of bottled water.

Our competitors, West Germany, Japan, Sweden, all sell gasoline at prices that are four, five, six, seven times the price we pay here today. Some would argue to you that if we raise the price of gasoline so that it reflects the full cost, the security, economic costs, we will cripple the American economy and destroy the moral fiber of our people. But I would suggest, if you look at the history of the last decade and the sorry economic condition of the countries which have kept prices artificially low for energy, the United States and the Soviet Union being the key examples, and compare it to the economic situation of those countries which have raised the price of energy to something like realistic levels, that have trusted their own citizens to make good judgments given honest information, what you see is that the economies of Japan, West Germany, even Italy have grown much more rapidly and stronger than our own.

As to the question, is the CFC phaseout enough: Clearly not. It is necessary, but not enough. They contribute about 15 percent of the global warming effect, but they, more importantly, actively contribute to the risks of rapid depletion of ozone in the stratosphere, as well.

So by eliminating the most dangerous chlorofluorocarbon compounds, shifting the fluorocarbon to other compounds that can perform the same function, we achieve the economic benefits we want, but reduce both the risks of climate change and the risks of ozone depletion.

Is the policy prescription that I would suggest to you good for Canada and Mexico? Should Mexico underprice its oil and gas or should Canada, even though they can take it out of the ground cheaper than the world price? No, I think not.

A look at developing countries over the last 15 years has shown that those who subsidized energy prices experience severe market distortions, gross inefficiencies and slower than average rates of economic growth. I would argue to you that by raising the price of energy so that if reflects the full cost, we would encourage the creative and innovative spirits of American business to develop those technologies that can meet our real needs while minimizing the emissions of dangerous pollutants into the atmosphere.

The process of doing that will promote the development of technologies that are likely to be at the cutting edge of export development in the end of the 1990's. We need those. We need the partnerships they represent with developing countries and we need to share the economic rents so that the development of these new technologies supports the objectives of both Third World countries and of high-wage jobs in the United States.

Thank you.

Mr. GLAUTHIER. I take it from your question, Congresswoman McKinney, that you are not a scientist. I am not a scientist either, and my colleagues here on the panel have a strong basis themselves in reaching these decisions. I find it very heartening to look at the National Academy of Sciences report, for example, in April of 1991 where our leading scientists examined the issue and came forward with very strong statements that the problem is real, that uncertainties are there, but it is a serious enough problem that we ought to take actions now, and they said it in very clear terms. We should take actions beyond those actions that are simply justified in other ways.

We ought to do some things specifically to help bring this problem under control, and they talked in terms of insurance.

One of the concerns that the scientists tell us about is that uncertainty in this issue cuts both ways. There is a wide range on temperature impacts and sea level rises and the other effects that could come, just as likely to be at the upper end of that range as the lower end. So we do need to worry. We have to do a lot more work on the science, but in the meantime we better take some actions as well.

You asked what action would be appropriate. I would agree with Dr. Mintzer that getting the prices right is the one thing that is a policy that will really help across the board, and in this area, the policy that would do that is a carbon tax.

I think eventually we really will want to have a carbon tax in this country and in concert with our major trading partners as a way to try to bring these uses and these emissions under control.

The question of the CFC's has been answered, I think, but I would add that the CFC example illustrates the effects that surprise can bring, and that is one of the rare cases where science has actually showed us an effect that both was very serious and very obvious and that it has gotten worse at about twice the rate that was predicted. So we do have to worry about the potential danger here.

Regarding Canada and Mexico, the United States and Canada have the highest per capita emissions of carbon in the world. We do need to take actions and the actions that we will take here should be very similar to those taken in Canada.

Mexico, I think, illustrates a different situation. And that is the situation of developing countries around the world where their economies need to continue to develop. They need to expand the use of energy throughout their economies, more industrialization will occur, and in many cases those emissions will rise over time. They ought to rise at the lowest possible rates.

We ought to encourage them to use the best technologies and for that reason, technology transfer is very important, and it also means it is all the more important for those of us in developed countries to reduce our emissions and bring them into line so that the overall pattern across the world is equitable.

Mr. LASHOF. Let me just amplify my colleagues' comments in a couple of respects. You suggested that some have argued that the Earth's climate system is self-correcting, and I think it is pretty easy to answer that question, because we have a remarkable record of the Earth's climate over the last 160,000 years. It has been reconstructed by painstakingly examining bubbles of air trapped in ice cores, and what that record shows is that, in fact, the Earth's climate has varied quite dramatically by swings of around 5 degrees centigrade in a relatively short period of time, and that it appears from that record that changing concentrations of carbon dioxide and other greenhouse gases are a major factor in contributing to those changes in climate.

A recent paper which was published on this shows that if you examine the historical climate record, the sensitivity of the climate to changes in greenhouse gases that you get by looking at that record is just about what the climate models are predicting for the future. So it is a fully independent verification of the predictions that the climate models have made.

There is uncertainty in that range as well, but the uncertainty range is very similar to what the models are suggesting.

The other comment that I would like to make, Mr. Barrody suggested that there is great risk of the United States going alone. I would say that the risk is quite the opposite. The risk is that we fail to act while the rest of the world does and we have a climate treaty, there is no chance that the United States is going to be going out all by itself and doing these kinds of things. I think the real risk to our competitiveness is that Germany and Japan move forward rapidly as they intend to do in developing the kinds of energy-efficient, clean technology which will be the currency of trade in the 21st century, while the United States says we are going to keep energy prices low, we are going to go with business as usual, and prop up our old industries and go forward as if nothing had happened.

Mr. GEJDENSON. Thank you.

The gentleman from North Carolina.

Mr. BALLENGER. Thank you, Mr. Chairman. One thing strange in the discussion is it appears to me if we are talking about clean air, clean energy, nobody made a mention of atomic energy at all as being a useful method of noncarbon-producing creation of energy. That one kind of bugs me a little bit.

And I would like to say that I know we are beating up on the Bush community, and since I am a Republican I would like to say, unless I am mistaken, the Clean Air Act came out when he was on watch and has had a rather large effect—I am a businessman myself, and Mr. Glauthier, you mention we ought to have a thousand businesses to do something about it.

Well, in my little hometown of Hickory, North Carolina, which is no big deal, I know of three companies, one of which is mine, that have spent, I would say, substantially close to $1 million in each one, in the effort to recycle the fuels, the gases that they produce and so forth, and that if the little hick town of Hickory, North Carolina is doing three, it doesn't take a whole bunch of areas to say a thousand is easy, and not only that, we—I didn't do it out of the goodness of my heart.

The EPA and the Clean Air Act got together and forced us to do it if we wanted to continue to operate. Now, that is not economics at its best, but it is what has occurred and I think what everybody expected with the passage of the Clean Air Act, and one question comes to my mind, I have no idea what the production of—whether it is million or multimillion something, but yes, Mr. Lashof, if you could take a hit at that—we got 250 people in this room and we are all breathing, what are we producing as far as bad gases?

Mr. LASHOF. OK. Plenty of hot air, I think, but——

Mr. BALLENGER. That is what we are noted for, right.

Mr. LASHOF. No net carbon dioxide emission. The reason is that biological systems essentially recycle carbon in a closed loop. What we do is plants take solar energy and takes carbon out of the atmosphere to produce plant tissues——

Mr. BALLENGER. If we had plants in here, I would agree with you.

Mr. LASHOF. Basically the energy that we use to run our own systems is renewable energy in that sense because we are using solar energy through plant material, which we return the carbon dioxide to the atmosphere when we breathe, but we are not increasing the net amount.

Mr. BALLENGER. I was trying to get a number that would make sense to somebody that is not a scientist to say a thousand people breathing for an hour producing so much carbon dioxide, and then you would have a number that—I mean, even some kid on TV could, look, daddy, look what they told me about this, or compared to what a diesel or one automobile or something like that.

Mr. LASHOF. I will get back to you with that. We can do that calculation, but I don't have it in my head.

[The information appears in the appendix.]

Mr. BALLENGER. I am just throwing out a whole bunch of stuff. And somebody mentioned the use of cleaner gases and recognizing that Brazil in its effort to avoid using oil as much as they possibly could, converting their sugar into ethanol, what kind of gas does burning—I mean we have got a bunch of people that we watch on sundays on TV, all these political things that are sponsored by some—Archer Daniels Midland that says we are going to save the world by burning ethanol. Since the Brazilians have done it for a couple of years—I realize they are burning their jungles down more rapidly than they are creating savings with ethanol, but does ethanol produce a hazardous carbon-type gas when you burn it in automobiles?

Mr. MINTZER. I think to give you a couple of—just to respond to a couple of pieces of the puzzle you have raised. One is this piece about ethanol. One is an indicator of carbon dioxide production rates, and the third is the role of nuclear power in this picture. The story about ethanol is basically it is a variant on what Dr. Lashof was just saying to you, that is, as long as the Brazilians are growing an amount of sugarcane that captures as much carbon as is released each year, that is, they are not harvesting the forest to get the ethanol, then all they are doing is carrying the carbon atom into the atmosphere out of the tail pipes of their cars, collecting it through sugar plants, digesting the sugar plants and feeding it back into the cars.

So it is a little recycling system in that sense as long as the rates match up. That is, as long as you only produce as much as ethanol.

Mr. GEJDENSON. Will the gentleman yield?

Is that the case? The amount of sugarcane that it takes to run one car—if I grow that much sugarcane, will it use up as much carbon?

Mr. MINTZER. Because the place you are getting the carbon to oxidize is from the carbon that has been fixed into the sugarcane. It depends on how far you drive the car as to how much sugarcane you have to grow.

For example, the average U.S. car driven today releases an amount of carbon dioxide in a year that is about equal to the weight of the car. Now, you would have to grow a lot of sugarcane to get that much ethanol because——

Mr. GEJDENSON. Do I end up creating more carbon?

Mr. MINTZER. No. You can't create carbon. You can only—you can only——

Mr. GEJDENSON. Do I have to have ever-increasing fields of sugarcane?

Mr. MINTZER. Depends on how much fuel you are trying to produce. It is a rate problem, that is, as long as you are growing——

Mr. GEJDENSON. If 1 gallon of ethanol will get me 30 miles, and I need 1 acre to do that, in theory at least, the processing and everything will be taken care of in that acre.

Mr. LASHOF. I think that is the key to understanding this. If all the energy for producing the ethanol comes from the sugarcane, then you can keep that acre going indefinitely and you can keep driving your car indefinitely. The problem with the way that Archer Daniels Midland produces ethanol right now is that they heavily subsidize their production of ethanol with huge inputs of oil to run the tractors and produce the fertilizers.

So if you do a net balance on that ethanol you find that we are getting about 80 to 120 percent as much CO_2 emissions per gallon as you would if you were burning gasoline. There are ways you can do it and reproduce ethanol in a renewable way, however, that is not what is being done right now.

Mr. BALLENGER. When it does burn, it does produce carbon dioxide.

Mr. MINTZER. That is right.

Mr. BALLENGER. All I know is you mentioned Mexico, that they don't have the problem yet. Somebody said that they are a developing nation and we shouldn't worry.

Mr. MINTZER. They have the problem already, pal.

Mr. BALLENGER. You can't breathe down there.

One more question, I think National Geographic or something like this, says that—and I don't know how you project the future growth of volcanic action or whatever it is, but in Mexico—it was the Philippines, somebody had a statistic that when this thing fired off over there, that it produced more carbon dioxide than you could—I don't know.

Is there—I mean, we could clean up the world as far as we are concerned, but if we didn't stop the volcanic action, would we still have the same problem?

Mr. LASHOF. I think we would not have the same problem. Volcanoes do affect climate. They do not produce significant quantities of carbon dioxide, but they produce significant quantities of sulfur dioxide, which goes into the stratosphere and in the case of Mt. Pinatubo, that cloud of sulfur dioxide, which will remain in the atmosphere for about 2 years, is beginning to go out now, does cool the planet for a period of time, and interestingly, this is another test of the climate models and they have proven to be quite accurate.

Jim Hansen of the NASA Goddard Institute of Space Science in New York predicted that as a result of that volcano, global temperatures would be reduced by about half a degree centigrade and that is about what we have observed. But that goes on for a period of 2 or 3 years.

The grave difficulty and the urgency of dealing with the carbon dioxide problem is the carbon dioxide that we take out of fossil fuels and move into the atmosphere will stay there for a very long period of time, for decades to centuries, so that we can have various temporary effects which may influence the climate and produce what is really noise in our attempt to see the signal from global warming. All that time we are accumulating a quantity of carbon dioxide in the atmosphere that will take a long time, indeed, to remove.

Mr. MINTZER. Could we get back to the nuclear issue?

Mr. GEJDENSON. Sure.

Mr. BALLENGER. I hate to run on you but I just got a note. I am terribly sorry.

Mr. GEJDENSON. You can answer the question for the record.

Mr. MINTZER. Nuclear power does produce energy with minimal amount of carbon dioxide. In the United States, we enrich our nuclear fuel by burning coal to fire the 12 plants at Oaks Ridge. So in the United States, enrichment is a significant source of carbon dioxide in the nuclear fuel cycle. If we made our nuclear fuel, as the French do, in breeder reactors, we wouldn't have that problem.

But more importantly, the question you raised is what is the role of nuclear in a strategy to reduce the risks of rapid climate change and I would argue to you that fundamentally we ought to be guided by, even in this case, by market mechanisms, that nuclear power is contributing to our energy picture and will continue to contribute to it for decades to come, but before we launch a major expansion of nuclear power, we should let it compete on a level playing field on the basis of its full fuel cycle costs with the other alternatives that are currently available to this country for generating the energy that we need, and so.

Mr. BALLENGER. If we add that 2 cents a year to the price of gas, pretty soon we get up to the point where nuclear energy will be cheaper.

Mr. MINTZER. It depends on how we account for the long-term cost of emission and waste disposal for long-life nuclear waste, and what I am suggesting to you——

Mr. BALLENGER. I recognize that——

Mr. MINTZER [continuing]. As Mr. Hemphill indicated, was that we do the accounting on the basis of the fuel, fuel cycle and we are honest about where we put in money and where we put in subsidize. We shouldn't subsidize renewals any more than we have currently subsidized nuclear. We should let them compete on a level playing field in the market.

Mr. GEJDENSON. Before we go to Mrs. Meyers, she represents an area of large corn production. At what point are corn farmers unemployed? Is it a half of degree that moves the corn growing area north enough so Kansas is more like the Sahara, or does it take a degree? She wants to know how much time she has before she should start trying to convert from corn to something else.

Mrs. MEYERS. I didn't know you were worried about me and I am very grateful.

Mr. GEJDENSON. I always worry about you because you are such a good member of the committee. Is there a way to calculate that, what it takes to move our big grain belt north, I guess?

Mr. MINTZER. This draws us, first of all, to the issue of the fundamental of lingering uncertainty in the science, that we can't tell on the basis of the models we now have what the precise regional distribution of effects is likely to be from a given global warming. The models and data are excellent in giving us a sense of what the change in the average global surface temperature will be, but whether it will be for a given rise of temperature half a degree warmer in Kansas, three-quarters of a degree warmer or 3 degrees warmer in Kansas, we can't now tell.

But it isn't just the rise in the average temperature that is going to effect the viability of corn growing in Kansas. I would suggest to you that it is also the likelihood of spells of unusual hot weather during the tasseling time that the corn is on the stalk. And so if we go through a transition period that increases the likelihood that you will have 10 days over 90 degrees during the tasseling period, even if the annual average doesn't go up that much, you can lose significant fractions of the corn crop.

But there is a further complication in the uncertainties that bedevil us and that is that even harder to predict than the change in regional temperatures is the regional distribution of precipitation, and because our models are so crude right now, we can't tell whether the rainfall that is traditional in Kansas is going to move to west Texas or is going to stay in Kansas at this point and we won't be able to for a considerable amount of time. We know that if the world warms by, say, 2 to 5 degrees, on average 7 percent more range or 5 to 7 percent more precipitation will fall worldwide.

But because of the way in which these nonlinear systems are coupled, we can't tell whether that will mean more intense storms in Kansas, more rain over the whole year, or just no rain when you need it during the critical periods of the corn growing cycle.

Mrs. MEYERS. I do appreciate that. I have read things in the past that indicate that it takes a very slight change in temperature to affect the Midwest agricultural region very severely, and so I am glad you clarified that. We certainly don't want that to happen, because when you were describing this use of ethanol, I had visions of Kansas being the new Saudi Arabia.

I would like to ask all of you, I think I can probably guess what your answer will be, and all of you have alluded to it somewhat in your testimony, but I would like you all to comment on the Btu tax that has been suggested by the President and what the impact of that will be.

Mr. LASHOF. I think that the Btu tax, as part of the overall package that the President has recommended, makes a good deal of sense, it has the one advantage compared with other taxes, and nobody likes to pay taxes if they can help it, that in addition to helping to fight the deficit, it will have some effect in reducing pollution and in particular in reducing global warming. The tax itself is quite modest.

It is about a 4 to 8 percent increase in the average price of energy at the consumer level. It will have, therefore, modest benefits in terms of increasing efficiency, but they are nonetheless real.

I think the other important point, though, about the way in which the package is put together is that the traditional problem, traditional reason why we have had difficulty passing energy taxes or pollution taxes of various kinds has been that taken by themselves, they tend to be regressive economically, and I think that the Clinton administration has done an extremely good job of putting together a package where you have an energy tax introduced at the same time as other measures in the Tax Code, most notably the earned income tax credit and the higher rates on the wealthiest taxpayers that make the Tax Code as a whole, more progressive.

Mrs. MEYERS. I think the problem that this tax may have, is that it seems to effect different regions in different ways. Kansas, and the Midwest generally, are very large, not densely populated States, so that people have to do a lot of driving to market or to get to a hospital. They are also very energy-intensive States because of farming, and also those states have a hard winter.

Now, those are the three factors that determine how an energy tax will affect a State. Large less densely populated States; energy-intensive States; and States with a fairly hard winter, are going to find this—I think—a very difficult tax to deal with.

Those who don't have all three of those factors may not find this tax so difficult to deal with.

Mr. LASHOF. Well, I think that any kind of tax that you put forward will affect different regions in different ways. This tax is very broad-based in its design. It affects all types of energy consumption and, in fact, the bulk of the revenues will not be collected directly from people who are using energy in their home, but, in fact, it will be incorporated in the price of products which is then sold all around the country.

So the price of corn may go up a little bit and it would be incorrect to assume that all of the costs, say, of running tractors and buying fertilizer in Kansas is a tax that ultimately is paid by people who live in Kansas. In fact, much of that will be incorporated in the price of products and meat that is sold around the country, so it is actually spread out, and when you do the distribution, this tax has been shown to be quite, quite even. I am not saying that there is no differentials, but it is quite uniform around the country.

Mr. GEJDENSON. If the gentlelady will yield, I think one of the reasons the administration chose the Btu tax is that it does, while no perfect tax in this area exists as far as equally distributing the burden, that this one comes closest to not creating regional disasters, even though the carbon tax would be far more beneficial environmentally. There are certainly economic regions of the country that would be devastated by the carbon tax.

The oil import fee would hit the Northeast in certain areas and there was the feeling that the Btu tax would spread it most evenly.

Mr. BARRODY. Mr. Gejdenson, may I?

First, generally, on the question of the Btu tax.

Mr. GEJDENSON. You are not feeling lonely at that end of the table, are you?

Mr. BARRODY. No, I feel honored to be in this company, sir. The Global Climate Coalition has long taken the position consistently that we would be opposed to any tax increase for energy to try to force changes and, we would say, dislocations on the economy for global climate purposes. We have not, since the proposal is still relatively new—let me say what we have done first.

We have, therefore, consistently opposed the imposition of a carbon tax. The Btu tax is a relatively new proposal from our perspective. We have not, therefore, formally decided on the question yet, and I think it is fair to say it is primarily devoted as a part of the President's program more to revenue concerns than anything else.

But having said that, and reminding you that I am also on the staff of the National Association of Manufacturers, I would call to your attention and would share with you subsequently and with the chairman and Mrs. McKinney, testimony that our President delivered last week before the Senate Energy Committee, in which, among other things, the geographical distribution of the affect of the tax was something we suggested was real and much more significant than Mr. Chairman you suggested, the Btu tax would fall State by State in very different ways.

Mr. GEJDENSON. Do they recommend an alternative revenue source?

Mr. BARRODY. Yes. The committee—in fact, the committee chairman had established or suggested that the purpose of the hearing was to look at the relative merits of an Btu tax versus a broad-based consumption tax, value added or something like——

Mr. GEJDENSON. And your people argued in favor of the value added tax?

Mr. BARRODY. Yes, and again, this was testimony for the National Association of Manufacturers, not the Global Climate. If I could elaborate just a moment, I don't feel alone, but I do feel that I have been differential over the last period of time.

Mr. GEJDENSON. These guys are pretty tough. If you disagree with anything they say, go ahead and take your shots.

Mr. BARRODY. I hope they will give me the same forbearance I have given them.

A number of things have been said. I will just try briefly to comment on them. First, it seems to me that there is an implicit premise in this discussion that the National Action Plan, which these hearings are about, need not, should not, is wrong, in fact, to consider taking into account the effects of such old solutions as the National Energy Policy tax which, after all, was passed way back in 1992 and the Clean Air Act amendments which was passed all the way back in 1990.

Our point is that just because they aren't, but predate the conventions taking effect doesn't mean they should be disregarded at all and that seems to me to be the planted premise of many of the statements that the National Action Plan is inadequate. In fact, another point, the National Action Plan suggests that the effects of policies it outlines will get us very close to stabilization, and it does not, as I said, take into account a full analysis of the effects of the National Energy Policy Act, the Clean Air Act amendments, the Intermodal Surface Transportation Act and other recently passed pieces of legislation, not to mention the Btu tax, should it take effect, that will have on greenhouse gas emissions by the United States of America, but even not taking them adequately into account, it suggests we may be only 1½ percent away from the stabilization level by the year 2000.

So I think we need to take all that into account. Another implicit premise is that the United States of America is not sufficiently showing leadership in this issue. I would say that the National Action Plan suggests a show of leadership by its very fact.

We acted first in response to the "prompt start" resolution, we have tabled a plan, and it is a plan which it is suggested will get us 1½ to 6 percent from stabilization on its own terms. We have lots more to learn, it may get us closer than that.

But my final point is simply on this question of leadership, that I think as this committee—this subcommittee newly looks at our international role in global climate, that we need to remember that over the last slightly more than 20 years, the United States of America as a society, has undertaken to clean up its air and water and no one would say that we have completed that job by a long shot, but we have undertaken commitments for which we have spent now in excess of $1½ trillion.

The first point about that is, if that is leadership, it is a show of leadership, the likes of which no other country in the world can emulate.

Second, in the process of spending that enormous amount of resources, we have developed dramatically effective technologies and knowledge that will allow us to build on those technologies which can then enable us to allow the rest of the world to develop with less carbon, greenhouse gas emission intensive activities.

The short of all that, and I apologize for the bit of harangue, is that I think that we have shown some leadership and we ought not to act as if we haven't.

Mrs. MEYERS. I would agree with that, and I think I am as torn as some of the members of the committee are, or of those testifying, because I am an environmentalist and I want us to take real leadership in the concern about global warming.

But I also would like to ask one more question based on this concern. I do think that as Mr. Barrody suggests, we have to do it in conjunction with the rest of the world, because to go back to a Kansas analogy again, you could just say, yes, it would just add a bit to the price of corn. But we don't set the price of corn in Kansas. That is set on worldwide markets, as almost everything is set on worldwide markets, so that if the United States is acting alone and way out in front of other countries, then we are going to be the ones who are losing jobs, losing markets to other countries.

I don't want that to happen either. So I would like it if you could all comment on where are we in our progress in relation to the rest of the industrialized world.

Mr. GEJDENSON. Will the gentlelady yield for one second?

I want them to answer your question, but it is my understanding that it was America's position in Rio against setting standards that would have had a worldwide implication. In that sense I agree with the gentlelady that what we did was to undercut a rational worldwide solution to the crisis by being the obstacle to setting some kind of international standard. Whatever we do helps because it is all one planet, but it is clearly better if we are all pulling in the same direction together. I think part of what we did at Rio undercut that and it primarily answers, obviously, the gentlelady's question.

Mr. GLAUTHIER. I would like to respond to that question and also to Mr. Barrody's statement. I think you are absolutely right, that we do need to do these things together, and, in fact, the negotiations on the treaty were done with generally 140 or more countries all participating to try to work out a common approach to this. In the end, all that we have agreed to as a starting point is to try to slow down the growth rate of our emissions, to stop our increase in emissions and get them back at least to 1990 levels, and then address the question of what next, and I think all of us in the environmental organizations would agree that the next step is that the

U.S. and like-minded countries want to push for negotiations to begin on what that common next step should be, and we think there ought to be a negotiation on a protocol, for example, to the convention that would actually lead to reductions in greenhouse gas emissions after the turn of the decade, but that needs to be something that is clearly done on an international basis.

The steps we have agreed to now are the steps we should be taking to reduce the growth in our gases. They are steps that have economic benefits and we believe have strong competitiveness advantages for us, and we see other countries like Germany and Japan taking those already. So so far we haven't asked for anything that is really going to put us at a disadvantage.

I would like to comment just briefly on the point that was made by Mr. Barrody. I think that he and I may agree on the point that we should take full credit for everything that is being done in our other programs, the Clean Air Act, the Surface Transportation Act, the recently enacted energy plan. The point we have been making is partly the orientation of this plan.

It ought to say that we have a goal, here it is, let's see how well we are doing, let's see what additional steps are needed, and then let's figure out what they should be, rather than just adding up what is happening in the world and commenting on it. So we should take full credit. It should be credible.

It should be done by independent sources where the data is sound, and we all agree that these are the reductions we are actually achieving.

Mr. GEJDENSON. Mr. Mintzer.

Mr. MINTZER. I would like to respond to the two questions that you raised, this one about should we act alone and the earlier question you raised about the Btu tax. I think that you put your finger on the nub of the problem in that the universal character of the global warming problem makes it essential that we act jointly with our allies and colleagues. It is universal in the sense that it is the emissions of these gases are linked to a range of economically important activities that cut across all sectors of American society and across all the countries with which we deal in trade.

So in order to construct an effective solution, we have to address those activities, not just in one sector, not just in terms of how it affects corn in Kansas, but how it affects all the important economic activity in the United States, but even as Mr. Barrody pointed out, if we did that and ignored the actions of our trading partners, including those in the developing countries, we would be inviting failure to our overall objective.

But I think it is worth noticing where we are in terms of our other trading partners. In particular, the United States is the only EOCD country, the only industrialized country, that hasn't adopted a target of specific, a specific, concrete target for stabilizing greenhouse gases or reducing them. The remaining partners in the EOCD have indeed adopted as a goal at least at the very minimal, inadequate as it is, of stabilizing emissions of carbon dioxide by itself at the 1990 level.

Mrs. MEYERS. Have they actually done this? At one point in time, I know that the European Community had adopted a goal, but then representatives hadn't gone back to their individual Parliaments and that was where the tough part was going to be.

Mr. MINTZER. I just met earlier—a week ago with some of the key people in the European commission who implement the decisions of the Community. The community has adopted as a goal a statement of policy on the basis of its council of environment and energy ministers, the stable legislation of greenhouse gas emissions. They have also adopted a form of legislation for a combined carbon and energy tax, but they have deferred the implementation of that tax until they see evidence of parallel movement in their key trading partners, that is, in the United States and Japan.

On an individual basis, a number of European countries have gone ahead to implement measures to achieve not just stabilization, but reduction. In Sweden, which is outside the European Community now, but will be inside in the next couple of years, they have introduced, even above the $6 a gallon gasoline price, a specific carbon tax on fuel use and on electricity.

In Italy there is also a carbon tax and in a number of other places carbon taxes are actively under consideration in their parliaments. The Japanese are considering in the Diet an environmental tax that will include a carbon tax component.

But I want to come back now to your question about the Btu tax and its fairness, specifically in this context. First a note about its scale. What we are discussing now is a tax that might, for example, raise the price of gasoline something like 2.5 cents a gallon now, 7.5 cents a gallon in 3 years. West Germany, which uses half as much energy to create a dollar equivalent of gross domestic product as we do, that is, they only consider their energy intensity is half of ours for the same economic output, when faced with the need to pay the bill for the Gulf War experience, raised the price of gasoline in Germany by the equivalent of about 65 cents a gallon, and it was adopted without any revolutionary change in its social structure.

So when they look at our proposal and the difficulty that we are having in considering the implementation of a 2.5 cent per gallon tax, many of the parliamentarians that I speak to in Germany have a little bit of difficulty trying to understand where the overwhelming obstacle is. But be that as it may, we have a different situation than they have.

Mrs. MEYERS. The size of the country would be a good place to start really.

Mr. MINTZER. But our driving habits are 10 times as long per year and our trucks don't go 10 times as far on a typical route, but the size of the country and the severity of the winters is a critical issue. To come back to the concept of the Btu tax, I have to say to you that I think on balance the President's program is an interesting and useful and constructive mixture of measures that both generate revenue and stimulate the economy.

Mr. BARRODY. Miss Meyers, can I comment on your first question, just on the last for a moment? Of course I think you are exactly right to raise issues like the size of the country and both socioeconomic differentials, distributional differentials, reliance on transportation, all of those things suggest that getting the price right, as Mr. Mintzer has said, is not quite so simple as some of his statements have suggested, but I wanted to go back to the question of commitments other countries have made.

My understanding is that in orator or rhetorical fashion, a number of them have indicated their intentions, but none, to the best of my knowledge, have yet put forward, despite the Prompt Start Resolution calling for them to do it, specific detailed plans for how they would get there, and the EC, for example, is a case you raised, my understanding is that the United Kingdom in its Department of the Environment recently published, "A Climate Change, Our National Program for CO_2 Emissions", and indicated therein that their emissions of CO_2 will rise from a current 160 metric tons equivalent of carbon in 1990 to 170 MMTC's in 2000 and that it will keep rising after the year 2000 to 183 metric tons of carbon equivalent in 2005 and 221 by 2020. That is not stabilization; that is growth in CO_2 emission.

Mr. MINTZER. Mr. Barrody is correct, the conservative government in the United Kingdom is acting in contravention of the European Community's joint commitment to limit CO_2 emissions to the 1990 level. It is worth noting, however, that the United Kingdom's action doesn't in the letter violate the EC commitment in that the commitment is a bevel concept that says the Community as a whole will stabilize at the 1990 level, not that each and every one of its member states will, and indeed every plan under consideration in the Community recognizes that the differentiated capabilities and responsibilities of states are such that some, like the more economically robust economies, Germany, France, Italy, will achieve reductions, while those less developed, less strong, in particular, Spain, Greece, and Portugal are likely to require increases in their emissions in order to achieve minimal levels of economic growth.

The U.K. is in a middle position and although they are—they have the potential to stabilize and reduce their own emissions without minimizing economic growth, the current government, the major government, has not chosen to adopt such a plan.

Mrs. MEYERS. Mr. Chairman, I am going to have to leave and I really regret it, because I think you have all done such an outstanding job, and I am very pleased that I was here at this hearing today.

Mr. GEJDENSON. Thank you. It is a great panel that we have here, and I just have a few more questions if you can indulge me with your time. One is that it seems to me that the administration's action plan didn't propose new policies and programs and that is not simply a statement that everything we have done in the past has no value, but it seems to me the scientific evidence indicates that there is much more of a challenge than just continuing at the status quo before us. Not only is there a challenge from an environmental point of view, but the thing that struck me most about what happened in Rio is a comment from a colleague, George Miller, who came back and said that what he found there was American opposition and the Japanese with sales and order forms for their technology. This is not simply something that is going to be a net loss to our economy, but it is possibly the single largest growth field for America to focus on. While there are some short-term costs maybe in leading that technological challenge, either

$370 or $900 billion in new electric and power facilities over the next 20 years, the country with credibility in the area of environment will get a significant portion, if not the lion's share of that market. That may be a lot of the real growth in the future.

The Japanese were there with the big facility showing off their environmental cleanup industries and the printing industry, which has been heavily damaged in this country because of the cost of pretreatment of some of the chemicals used in printing. It is in danger, not from low wages, but by the fact that the Japanese are developing new environmentally nondamaging printing technologies that may move printing activities not from low wages in the United States to lower wages somewhere in the Pacific Rim, but to higher wages in Japan because of the environmental systems in place.

So I guess the two questions that I have had, whether it is printing or refrigerators or trucks or automobiles, the danger to the United States is to think there is not going to be another energy crisis and we can just build bigger and more gas guzzling cars and we will keep our share of the market on the day the prices go back to $40, $50 a barrel. We cannot simply burn coal and damage the environment to give us a long-term competitive edge.

I guess I have a two-part question. One is, how do we sell to the American people who are still psychologically in a recession and therefore anxious about anything that appears to make us less competitive in the short term? How can we point out that this is an economic benefit maybe in the short term, it is a tighter race but clearly in the long race it is critical, and how do we also get Americans to understand the percentage of the responsibility in the developed world?

In China, there are over 1 billion people, there are 1 billion people in India, there are only a couple hundred million of us in the United States, 300 million in Europe, and 150 million or so in Japan. Are we taking on too big a role, which I don't think is the case, but how do we get across the message, how much of this is actually coming from the industrialized world, and shifting to international burdens may mean helping the Third World and the developing world develop cleaner technologies which help all of us, because we are all in this little envelope together.

Mr. HEMPHILL. If I could, I mentioned in my testimony briefly a study that looked at this very issue. This study assessed the net impacts on jobs, if we were to have a future that would result in a significant reduction in CO_2. I will leave you a copy of this study. This study concluded that there would be a net increase in jobs of approximately 170,000 jobs while achieving a reduction in CO_2. I would like to point out that a study done by U.S. AID projected the market opportunity internationally for U.S. renewable and energy efficiency technologies is huge. Already today much of our technology is marketed abroad. With the growth in these technologies, it is only reasonable to assume that there will be similar growth would occur internationally. We see this as a tremendous market opportunity for companies in the United States.

Mr. LASHOF. Mr. Chairman, I don't think that you have as difficult a sell to the American people as you might think. In fact, polling data shows that Americans do believe that there are opportunities to invest in clean technologies that will create jobs and protect the environment. The American people have never bought the false choice between jobs and the environment that some have tried to sell it on, and equally I think people recognize that the 250 million people here are responsible for something like 20 to 25 percent of global emissions.

So I think that there continues to be a difficulty of getting this through inside the Beltway here in Washington because of the powerful interests particularly of elements of the energy industry, the traditional oil and coal industry that resist change, but, in fact, as President Clinton has done, going to the American people and saying that we have an opportunity here, I think will be very well received.

Mr. GEJDENSON. Mr. Mintzer.

Mr. MINTZER. Mr. Chairman, let me take the second of your questions first and then come back to the first one about how do we help the American people understand what their share of the responsibility is. Leaving aside the issue of historical contributions to greenhouse gas buildup but just talking for a moment about who is doing what to whom today, on average, there are about 5.3 or 5.4 billion tons of carbon emitted per year. That is about 1 ton of carbon per person on the planet.

The U.S. average is about 5 tons of carbon as carbon dioxide per person. The average for India or China on a per capita basis is about .01 tons of carbon per capita. The average for a variety of developing countries ranges from about .01 to about .3.

Mr. GEJDENSON. Is that available somewhere in a chart?

Mr. MINTZER. I can provide it to you in a chart. But I think the basic point here is one of the issues that Americans do understand well is the basic concept of equity and of fair share and if we can accept that the atmosphere has a limited sink capacity, that is, if we pour into it carbon dioxide or other greenhouse gases at a rate that significantly exceeds the natural removal rates, and there is some limit at which we are likely to cross one of these nonlinear thresholds provoking surprises like the ozone hole, it would be relatively straightforward, I think, to explain to most Americans that we have to distribute the privilege and the opportunity for those emissions in a more equitable fashion. Whether everybody has to get the same amount or some have to get more remains to be negotiated, but clearly a ratio of 500 to 1 isn't equitable.

On the question of how do we sell to the U.S. people the idea that this dark cloud of future storms may have a silver lining, I think that the issue here is really helping people to understand that what we are doing is promoting the economic development of the United States, shifting the composition of economic activity, but trying to do it in a way that minimizes the dislocation and the disruption to people's lives.

Every change that has taken place in this country in the last 200 years has resulted in some dislocation. We now have the opportunity to foresee some of those dislocations and to provide a safety net of various types for the people under it. We are in a situation where speaking to Joe Sixpack smoking two packs of cigarettes while drinking a six-pack of beer sitting on his couch in front of a football game and asking him——

Mr. GEJDENSON. Save the gas of driving to the football game, should applaud him environmentally.

Mr. MINTZER. But what it puts at risk is the every growing expenditure on health insurance and health care in the United States. If we ask him to just give it up for nothing, to abstain from all the things he likes, it is unlikely that all of America's men will leap to the opportunity to forego football, potato chips and cigarettes, but recognizing that the prospects include living a longer life with one's children, living a more productive and a richer life with one's wife may help even American men to see that changing the composition of their——

Mr. GEJDENSON. It is not our fault. The women have some of the blame here I think.

Mr. MINTZER. Certainly that has got to be true.

Mr. GEJDENSON. I get the analogy, that is, you are right, we have to get that message out that there is a benefit.

Mr. MINTZER. It is not only an advertising problem. It is a problem of constructing comprehensive consolidated plans like the President's that not only offer sacrifice, but that stimulate the introduction of the kinds of technologies that can compete in a global marketplace over the next 20 years and do it in a way that promotes high wage jobs in America, that retrains American workers who are displaced and that provides all of our children with the opportunity of a good education that can make them fit for the changing marketplace of the 21st century.

Mr. GEJDENSON. We see the problem now with the defense industry, having not prepared for diversification and conversion in serious ways. As a country we are about to go through a painful crisis, although it is clear some time ago that we needed to prepare for that.

In the same way, if we wait until this catastrophic climatic change, the dislocation will be far more serious.

Mr. BARRODY. Mr. Gejdenson.

Mr. GEJDENSON. Mr. Barrody, I am going to let you speak. I am going to say at the beginning you argued against targets. As somebody who represents a setting with a timetable, it seems to me as somebody in business you would want government to set targets and timetables so that we don't surprise you, so that we don't give you new policy, all of a sudden. That we should tell you some kind of time line appears to be reasonable.

Mr. BARRODY. Mr. Gejdenson, just the opposite, and in fact the imposition on the current situation where we may be 1.5 percent away from stabilization of a hard and fast, not going by timetable, but command and control regime that would require us to get the other point and a half would be loaded with surprises about the way we would be expected to get there. So I would have to take issue with that. We feel very strongly that the goals and timetables provisions first do not impose on the United States or any signatory to the convention a hard and fast requirement.

I think the record of the ratification and indeed the negotiation of the convention makes that very clear, but also we believe as strongly that that was the right, not the wrong way to go, because a certain amount of—well, you use the term surprise, if as I said, to repeat myself, if we are submitted to a regulatory regime, indeed a global one, that would require us to get that other point and a half of the way, if that is what the disparity turns out to be, I think all of us are going to be surprised at what it is going to take to get there.

I did want, in defense of football, just to say that the mere existence of the pigskin is helpful to global climate concerns because it is one less live pig to contribute to the problem, and finally, in answer to one of your questions, forgive me, I don't remember now whether it was the first or the second, we shouldn't forget the idea of a technology cooperation core, which is one way, if we move into this the way I think we should, recognizing it is a global problem and that the United States, and not just the Germanys and the Japans of the world, have a good deal to offer the rest of the world, the developing world especially in terms of know-how and technology about how to develop with less greenhouse gas emissions, then that is the way to do it and in your terms sell it to the American people as in their interests.

Mr. GEJDENSON. Thank you. I appreciate the panel for its patience and we hope that you will stay in contact with us, or on your own initiative. We will certainly followup on some of what you said. Thank you very much. The record will be open for 2 weeks.

[Whereupon, at 3:45 p.m., the subcommittee was adjourned.]

Natural Resources
Defense Council

1350 New York Ave., N.W.
Washington, DC 20005
202 783-7800
Fax 202 783-5917

APPENDIX

Statement of

Daniel A. Lashof, Ph.D.
Senior Scientist
Natural Resources Defense Council

before the

Subcommittee on Economic Policy, Trade, and Environment
Committee on Foreign Affairs
U.S. House of Representatives

March 1, 1993

Introduction

Thank you Mr. Chairman and members of the Committee. I am Daniel Lashof, a senior scientist with the Natural Resources Defense Council (NRDC). Previously I was an Environmental Scientist at the Environmental Protection Agency, where I was the lead author of the Report to Congress *Policy Options for Stabilizing Global Climate*. I hold a doctorate in Energy and Resources from the University of California, Berkeley, where I specialized in the global carbon cycle. I appreciate the invitation to appear here today.

NRDC is a non-profit environmental protection organization, founded in 1970 and supported by 170,000 members. NRDC's Energy Program has more than ten years of experience in promoting energy efficiency and least-cost energy planning. In 1988 NRDC launched its Atmosphere Protection Initiative (API) to provide a coordinated response to the related threats to the integrity of the earth's atmosphere -global warming, ozone depletion, acid rain, and urban smog. This effort involves more than a dozen NRDC scientists, resource specialists, and attorneys expert in climate, energy efficiency, nuclear energy, forestry, agriculture, international environment, air pollution control, and coastal protection.

NRDC participated as an observer throughout the process of negotiating the United Nations Framework Convention on Climate Change as well as in the deliberations of the Intergovernmental Panel on Climate Change. NRDC is also an active participant in the Climate Action Network, an international coalition of non-governmental organizations working for climate protection. In today's testimony I will review the National Action Plan submitted last year by the Bush Administration in light of U.S. obligations under the Convention and the international scientific assessment of global warming. I will then make recommendations regarding preparation of an acceptable action plan.

The Basis for Taking Action

The U.N. Climate Convention was negotiated following a process of international scientific assessment conducted under the auspices of the Intergovernmental Panel on Climate Change (IPCC). The Bush Administration summarized this assessment in an accurate and balanced manner:

> "The following represents a consensus view of a broad range of scientists, including most U.S. scientists, who have participated actively in the international effort to understand the issue:
>
> "Climate Change: While scientists cannot yet establish that a human-induced warming has already occurred, best estimates indicate that increased concentrations of greenhouse gases are likely to increase atmospheric and ocean temperatures and alter their associated circulation and weather patterns. However, the magnitude, timing and regional details of these changes cannot be predicted with much certainty. Climate models predict changes in the average temperature of the globe's atmosphere as a consequence of a doubling of atmospheric concentrations of carbon dioxide are unlikely to lie outside the range of 1.5° to 4.5°C (2.7 to

> 8.1°F), with a best estimate, based on model results and taking into account the observed climate record, of 2.5°C (4.5°F). Associated sea-level rise has been estimated to range between a few tens of centimeters and approximately 1 meter (less than 1 foot to approximately three feet). In addition, observed warming in recent years is of the same magnitude as that predicted by the models but also of the same magnitude as natural variability. Thus, the observed increase could be due predominately to natural variability or could be part of a larger warming offset by other human factors. Potential impacts of climate change are likely to vary considerably from region-to-region, with particular risks for drought-prone areas, irrigated agriculture, water resources, coastal zones and natural ecosystems. Precise evaluations of the impacts of climate change are not likely to be available for a decade or more."[1]

Responding to this scientific assessment, the parties to the climate convention adopted the following objective (Article 2):

> "The ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner."

The Stockholm Environment Institute (SEI) in its report on *Targets and Indicators of Climatic Change*, has concluded that to ensure that this objective is met the rate of warming must be kept to less than 0.1°C (0.2°F) per decade, and the absolute warming to less than 1-2°C (2-4°F) compared with pre-industrial times. Warming greater than the lower limit of 1°C (2°F) "may elicit rapid, unpredictable, and non-linear responses that could lead to extensive ecosystem damage," while beyond 2°C (4°F) "the risks of grave damage to ecosystems, and of non-linear responses, are expected to increase rapidly."

To prevent warming of more than 1°C (2°F) the SEI study estimates that the atmospheric concentration of greenhouse gases would have to be limited to the equivalent of 330-400 parts per million (ppm) of CO_2 (this is called the CO_2-equivalent concentration). The concentration of CO_2 in the atmosphere is already over 350 ppm, and the CO_2-equivalent concentration of all greenhouse gases exceeds 400 ppm, thus the world is most likely already committed to exceeding the 1°C (2°F) limit. To avoid exceeding even the upper limit SEI estimates that greenhouse gas concentrations would have to be limited to 400-560 ppm CO_2-equivalent.[2]

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[1] *U.S. Views on Global Climate Change.* U.S. Department of State, April 1992.

[2] This range is based on a climate sensitivity to doubling CO_2 concentrations of 1.5-4.5°C, which has been accepted by the Bush Administration, as quoted above.

To be prudent in the face of uncertainty we should adopt a goal in the lower half of this range. Thus the objective of the Climate Treaty translates into a goal of limiting the atmospheric concentration of greenhouse gases to 475 ppm CO_2-equivalent. Based on feasible limits for the concentrations of greenhouse gases other than CO_2 I calculate that this target requires holding CO_2 concentrations to about 400 ppm. Immediate action to reduce CO_2 emissions is essential if this limit is not to be exceeded.

Industrialized countries, with 25% of the world's population, are responsible for 75% of current global emissions of CO_2 from the energy sector. Reducing energy-related CO_2 emissions from industrialized countries is the most important action needed to combat global warming, and is essential to achieve the global targets just discussed. In particular, a protocol to the climate treaty should be adopted that would require all industrialized countries to reduce energy-related CO_2 emissions to at least 25% below 1990 levels by the year 2005.

Developing countries, with 75% of the world's population, are responsible for 25% of global energy-related CO_2 emissions. These emissions are expected to grow to meet legitimate development needs. In order to remain within the global CO_2 target of 400 ppm the aggregate increase in CO_2 emissions from developing countries would have to be limited to no more than 50% over 1990 levels by 2005. As called for in the Convention, the incremental costs of achieving this target should be borne by the industrialized countries, in accordance with their responsibility for the preponderance of all past emissions that have elevated greenhouse gas concentrations to current levels.

Deeper cuts in CO_2 emissions from all countries will be required after these dates in order to stabilize atmospheric greenhouse gas concentrations. Let me emphasize that stabilizing emissions of greenhouse gases at current levels will allow greenhouse gas concentrations to continue increasing at roughly current rates. The only way to stabilize atmospheric concentrations of CO_2 is to cut emissions by 60% or more, according to the IPCC.

The Bush Administration's Action Plan

NRDC believes that the National Action Plan (NAP) released by the Bush Administration in 1992 fails to meet U.S. commitments under the Climate Convention in at least two key respects: First, the Bush Administration NAP does not demonstrate an aim of returning emissions of greenhouse gases to 1990 levels, as required by Article 4; Second, it was not prepared with public participation as required under Article 6.[3]

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[3] The U.S. is not technically in violation of the treaty because it is not legally required to submit its national plan under the treaty until six months after entry into force. (The treaty will enter into force after 50 ratifications, which could occur by the end of 1993.) However, the text of the NAP suggests that this document is intended to be a formal submission to the Secretariat of the Convention. As such is does not fulfill U.S. obligations under the treaty.

Article 4(2)(b) states, in part, "Parties shall communicate...detailed information on its policies and measures...as well as on its resulting projected anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol for the period

(continued...)

Rather than providing a strategic plan for capping and then reducing U.S. emissions of greenhouse gases, the Bush Administration NAP is primarily a description of U.S. circumstances and existing programs. Where projected emission reductions from new programs are provided the document fails to provide an implementation plan to ensure that the projected reductions are realized.

The Bush Administration NAP places too much emphasis on describing the U.S. economy and government structure as well as on the possibilities for adapting to climate change. Furthermore, the emissions inventory presents obsolete data for 1988 using inconsistent units and sometimes inconsistent values compared with other sections of the report. Far from being a model for how an emissions inventory should be developed, neither the data sources nor methodology for deriving national estimates are presented. The document also fails to provide a clear presentation of baseline emission forecasts.

The most important failing of the Bush Administration NAP, however, is that the mitigation section does not provide a plan for capping and then reducing greenhouse gas emissions. Instead it provides a mixture of existing and planned programs, some of which include projected emission reductions while other do not. Glaringly absent are energy taxes and policies to reduce emissions from the transportation sector, in particular through automobile efficiency improvements. Moreover, there is no specific plan of actions that must be taken by government agencies and the private sector in order to achieve those emission reductions that are specified.

Toward a Real Action Plan

The Bush Administration NAP is flawed in so many respects that it must be completely rewritten in order to produce an acceptable plan. On the other hand, the existing document and particularly the public comments on it can provide some useful material for a new action plan The U.S. Climate Action Network recommends that the Clinton Administration announce at the upcoming meeting of the Intergovernmental Negotiating Committee (INC) that it plans to thoroughly revise the U.S. NAP in time for the subsequent INC meeting and that the new NAP will demonstrate how the U.S. plans to cap emissions at 1990 levels by 2000. Drawing on the public comments the Administration should revise the NAP using the following general guidelines:

- The NAP should detail a credible plan for capping emissions of carbon dioxide and other greenhouse gases not controlled by the Montreal Protocol at 1990 levels by the year 2000, with subsequent emission reductions of 25% by 2005.

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[3](...continued)
referred to in subparagraph (a), with the aim of returning individually or jointly to their 1990 levels these anthropogenic emissions of carbon dioxide and other greenhouse gases not controlled by the Montreal Protocol."

Article 6(a)(iii) requires "public participation in addressing climate change and its effects and developing adequate responses;".

- The NAP should provide specific baseline and post-policy emission projections from 1990 through at least 2010.
- The NAP should include a specific implementation plan including programmatic timetables and required budgets by agency.
- The NAP should include an evaluation procedure for regularly assessing whether the U.S. is on track to achieving its stated emissions targets, with provisions for adopting additional measures (e.g., increasing energy tax rates) if emissions are higher than anticipated.

Additional Measures Needed to Cap Emissions

The most recent DOE/EIA reference case projection (Annual Energy Outlook 1993) indicates that carbon dioxide emissions will increase from 1340 million metric tons of carbon (MMTC) in 1990 to 1500 MMTC in 2000. Thus an emission reduction relative to the reference case of 160 MMTC by 2000 is needed to return emissions to 1990 levels by that date.

If properly implemented, many of the measures in the existing action plan could significantly reduce greenhouse gas emissions from projected levels. In particular, EPA's voluntary public-private partnerships, such as Green Lights, Energy Star Computers, and Golden Carrot Refrigerators, have been highly successful to date. These programs, however, remain woefully underfunded relative to what would be needed to achieve the market penetration targets in the NAP. If adequate funding is provided, the combination of EPA's programs, effective implementation of the Energy Policy Act of 1992, and ongoing state-level and utility efficiency programs might reduce CO_2 emissions in 2000 by approximately 100 MMTC relative to reference case levels.

The policies enumerated below complement or augment those in the existing NAP. Estimated emission reductions are given for the year 2000 relative to reference case levels.[4] The total additional emission reduction potential comes to 80-110 MMTC, assuming that all savings are additive. This would give total emission reductions of 180-210 MMTC, significantly more than the 160 MMTC needed to achieve 1990 levels in 2000. For most of these programs emission reductions would be substantially larger in later years.

In practice emission reductions from each program are not simply additive. There would be overlap in projected savings in some cases and synergisms in others. It is clear, nonetheless, that an effective strategy to cap and reduce carbon dioxide emissions can be devised and implemented.[5]

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[4] These estimates are largely based on: Alliance to Save Energy, American Council for an Energy-Efficient Economy, Natural Resources Defense Council, and Union of Concerned Scientists, *America's Energy Choices: Investing in a Strong Economy and a Clean Environment.* (Union of Concerned Scientists, Cambridge, 1991.)

[5] A model capable of following the capital stock of the most important energy using buildings and equipment is needed to verify this result. Such a model was employed in the *America's Energy Choices* study cited above. The supply-demand scenarios developed in that study demonstrate that this conclusion is indeed robust.

The importance of timing can not be over-stressed, however. Much valuable time has already been lost since the 1988 Toronto Conference first called for a 20% reduction in emissions. The turn of the century is now just seven years off. Each program outlined here will take some time to get off the ground and additional time to achieve significant emission reductions as equipment turns over. The Administration and Congress must move quickly to adopt and implement a real National Action Plan to arrest global warming.

APPENDIX. ADDITIONAL MEASURES FOR NATIONAL ACTION PLAN

ENERGY/POLLUTION TAX 20-30 MMTC

The BTU tax proposed as part of the Clinton-Gore economic package is projected to reduce emissions by 1.5-2%. This reduction would come in part from the direct effects of the tax on its own, but perhaps of equal importance, it would allow the other measures to penetrate markets more effectively. The tax rates could, of course, be increased if necessary to achieve a particular emission target.

INCREASE AUTOMOBILE EFFICIENCY & REDUCE TRAVEL 30-50 MMTC

Substantial carbon reductions can be achieved in the transportation sector by improving vehicle efficiency and reducing vehicle miles travelled (VMT).

Options to slow the growth of VMT include increased investment in mass transit and introduction of transportation demand management measures such as pricing strategies (tolls and parking fees), removal of tax subsidies for parking, integrated transportation and land-use planning, and zoning reform to discourage sprawl. (Existing transportation, energy, and air quality legislation gives new impetus to these types of measures) Introduction, by states, of programs to collect insurance payments through a surcharge on fuel consumption (known as "Pay As You Drive" insurance), would help to further dampen VMT growth.

Improvement in vehicle efficiency can achieved by increased CAFE standards, complemented by a variety of market mechanisms (such as fee and rebates systems to reward consumers or manufacturers for the purchase or sale of more efficient vehicles). Because increased standards require roughly a five-year lead time, immediate implementation of an aggressive market incentives programs is necessary to provide significant carbon reductions by 2000. (Even in the current new vehicle fleet, consumers could shift to substantially more efficient cars. The average fuel economy of the most efficient models in each new car class is already close to 35 mpg)

Besides market incentives and raised CAFE standards, a public-private partnership to develop "super" clean and efficient vehicle, coupled with fleet procurement programs to develop markets for these vehicles, as recently announced as part of the Clinton-Gore

Technology Policy, could achieve some added near-term benefits and lay the foundation for long-term carbon reductions.

The high end of our estimate for carbon reductions (50 MMT by 2000) can be achieved through a combination of reducing VMT by 5% to 8% below the projected year 2000 level and by increasing new light-duty vehicle (car and truck) efficiency by an additional 17% over the 10% improvement assumed in the baseline.

RESIDENTIAL AND COMMERCIAL BUILDINGS

Federal Buildings 5 MMTC

The National Energy Policy Act of 1992 calls for a 20% reduction in the energy consumption of federal buildings by the year 2000. If this goal were actually achieved, it would produce annual carbon reductions of about 5 MMT by 2000.

Energy Efficient Mortgages 5 MMTC

A uniform Energy Efficient Mortgage (EEM) program could upgrade the energy efficiency of at least 1 million homes per year by 1996 and a total of 6 million homes by 2000. Implementation of an effective EEM program requires: uniform and streamlined documents and procedures for all mortgage underwriters (Fannie Mae, Freddie Mac, HUD, VA); incentives for home buyers, lenders, and investors; coordination with utility Demand Side Management (DSM) programs; training for realtors and lenders; and aggressive marketing. Energy savings equal to 40% of national average residential consumption in each of 6 million homes could be achieved by 2000, reducing emissions by 5 MMTC.

Advanced Heat Pumps 5 MMTC

Both the penetration and average energy savings can be increased compared to what is currently in the Action Plan, increasing savings by 5 MMTC.

Green Thermostats 5 MMTC

The installed costs of computerized automatic set-back thermostats could be reduced dramatically through aggressive mass production and marketing. Savings of 15% in 30% of the housing stock would cut emissions by 5 MMTC.

SHIFT TOWARD LOW CARBON FUELS 10 MMTC

In addition to the energy tax discussed above, there are other important measures that could be taken to encourage a shift toward natural gas and renewable energy sources. These include removing barriers to the use of natural gas (at both the state and federal level), aggregating a market for renewable energy technologies to encourage economies of scale, and expanding targeted tax incentives for renewable energy supply.

WWF

Testimony of
Mr. T.J. Glauthier
Director, Energy & Climate Change Policy
World Wildlife Fund

Subcommittee on Economic Policy, Trade and Environment
House Committee on Foreign Affairs
March 1, 1993

Hearing on
"Global Climate Change: Adequacy of the National Action Plan"

I am T.J. Glauthier, Director of the Energy and Climate Change program at the World Wildlife Fund ("WWF"). I also coordinate the policy work of WWF organizations throughout the world on energy and technology transfer related to climate change.

World Wildlife Fund is the U.S. affiliate of the international WWF family. WWF is the world's largest private conservation orgnization, with over 1.2 million members here in the U.S. and over 4 million members worldwide. We have national organizations or representatives in nearly 40 countries around the world, including developing countries in Asia, Africa, and Latin America. Since its founding in 1961, WWF-US has supported over 2,000 projects in 116 countries.

I also wish to identify myself and my organization as active participants in the Climate Action Network ("CAN"), a coalition of non-governmental organizations working on the climate change issue here in the U.S. and around the world. The members of CAN have reviewed the U.S. National Action Plan in detail and are preparing extensive comments that will be filed shortly with the government as part of the public comment process. While I cannot speak specifically for all of the members of CAN, my comments today, together with those of Dan Lashof and Irving Mintzer, who are also active in CAN, will give you a sense of the general reaction of the NGO community to the U.S. Action Plan.

It is particularly timely that you choose this time to address the U.S. National Action Plan that is called for under the Framework Convention on Climate Change, which the United States ratified in October 1992. This is the time to decide how to proceed with the Action Plan, since the new Clinton Administration is now getting its staff in place, the comment period on the draft Action Plan of the Bush Administration draws to a close a week from today, and the next meeting of the parties to the Convention occuring in two weeks.

There are four key recommendations that I would like to make today with reference to the draft National Action Plan for Global Climate Change, published in December 1992:

- The draft Plan needs a 180° shift in orientation, to become a strategic, document that sets goals and drives actions within the Administration.
- The "Action Plan" needs more actions. The current draft does not meet the test of a good faith plan, because it does not achieve the emissions reduction goal of the treaty.
- The technology transfer section of the draft Plan should also be changed to be "strategic". It should contain specific goals that will drive the program, and actions to assist the U.S. private sector in undertaking projects abroad
- The revised U.S. National Action Plan is needed soon--the Administration should put it on a "fast track" as the pacing activity for our nation's climate change program We should commit to publishing it by August 1993 and call on other developed countries to do likewise

The Subcommittee raised the question of whether the draft U.S. Plan should be revised or completely scrapped in favor of a fresh start. This question is largely a matter of semantics. In either case, the thinking and public comment that has been collected is relevant and some sections of the draft will be useful, such as descriptions of program elements and research plans. However, the revisions that are needed are so extensive that the final version should be substantially different from the draft.

I will expand briefly upon each of these recommendations, and will be happy to explain our thinking further in response to questions.

(1) The draft Plan needs a 180° shift in orientation, to become a strategic document that sets goals and drives actions within the Administration. The draft Plan is not goal-directed. It is merely a compendium of programs and actions that are being undertaken anyhow for other reasons, and happen to help reduce greenhouse gas emissions.

This Plan should be a strategic document It should be the statement of strategy for our nation's climate action program. As such, it needs to set forth goals, priorities, and program directions that are instructive to other countries and useful on a day-to-day basis here in our own country in making research, policy, and resource decisions.

Our final Plan should embrace the objective of the Convention and make a clear, explicit commitment to meeting the target of returning greenhouse gas emissions to their 1990 levels by the year 2000. Then, the body of the document should spell out in detail our strategy for achieving that. Our Plan should also include a commitment to monitoring our progress and adding additional measures to the Plan or increasing their pace, if subsequent information shows that the actions we've laid out are not adequate to meet the 2000 target

In making the Plan a goal-driven document, we recommend that a substantial amount of restructuring be done as well. The current draft dilutes the attention on mitigation actions, which should be the primary focus of our "Action Plan". It places that chapter in the second half of the book, after lengthy sections on the special circumstances of our country (namely, why we have so much difficulty reducing emissions) and on adaptation actions (how we can learn to live with climate change rather than stop it). In fact, together these chapters are twice as long as the chapter on mitigation actions, which should be the principal focus of the Plan.

In revising the Plan, we recommend shortening these background sections drastically and increasing the emphasis that is placed on the actions that the U.S. is, or will be, taking to reduce greenhouse gas emissions to mitigate this problem

(2) The "Action Plan" needs more actions. The current draft does not meet the test of a good faith plan, because it does not achieve the emissions reduction goal of the treaty. The estimates presented in the draft show that greenhouse gas emissions under the Plan will still be 1.4 to 6 percent above 1990 levels in the year 2000. The treaty is quite clear that at least our national plans should "aim at" returning emissions to their 1990 levels by the end of the present decade. To be a good faith effort, any Plan must at least project meeting that target. In fact, using the numbers in the draft, it is possible that the steps in the Action Plan will only go halfway toward the 2000 target!

In addition, I understand that a number of the technical assumptions underlying these calculations are optimistic and may overstate the emissions reductions that will actually be achieved by the listed actions in the Plan. In particular, there are questions regarding whether the market penetration rates projected for new "green" technologies are achievable, given the level of resources and regulatory support anticipated for them. If the draft Plan's estimates are derived from a "rosy scenario", then the situation in the year 2000 may be much worse than we think, with an even greater need for additional emissions reductions.

Another concern involves the way the U.S. draft Plan combines individual greenhouse gases into overall "carbon equivalents", in order to report a single, overall result. Unfortunately, while that is simpler to report, it is not consistent with WWF's understanding of the country's obligations under the treaty. Article 4.2(b) requires each developed country to report "...detailed information on its policies and measures as well as on its resulting projected anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol..." (emphasis added). WWF's reading of that requirement is that each country must report its projected emissions and removals separately, and to do so gas by gas. The draft, therefore, needs revision to disaggregate "net" emissions figures and data presented in carbon equivalents.

Clearly, what is needed by the Clinton Administration is a credible package of programs and actions that technical experts agree will be sufficient to achieve our national goal under the treaty. That will require adding more measures now, and including a commitment to monitor results and add additional measures later if that is needed.

Some of the additions will be straightforward These are the actions in the President's economic proposal that will also have the benefit of reducing energy usage or other greenhouse gas activities. The Plan needs to contain quantified estimates of the emissions reductions that will occur as a result of steps such as the energy tax, funding for mass transit, increased funding for EPA's "green" programs, such as "Green Lights", federal fleet conversions to alternative fuels, federal facility improvements to increase energy efficiency, and support of technology and energy efficiency development programs

Other additions may require separate consideration. For example, this Administration could be more aggressive in implementing the energy efficiency and other provisions of the Energy Policy Act, passed last October, and then could take credit for such changes. If still further emissions reductions are needed, I would look for additional actions related to transportation, especially automobile fuel efficiency. This is one of the largest sectors contributing to greenhouse warming in the U.S., and yet it was virtually ignored in the development of the draft Plan.

(3) The technology transfer section of the draft Plan should be changed to be "strategic". It should contain specific goals that will drive the program, and actions to assist the U.S. private sector in undertaking projects abroad. The present draft on technology transfer lacks both goals and any statement of strategy. At this point, it contains just a listing of examples of activities that fall within this sphere, but without direction.

The entire treatment of one key area, for example, "Technology Development and Transfer", consists of a one sentence introduction followed by 22 bullets of examples of U.S. projects, half of which are AID projects. These may be valuable, sound projects. However, there is no attempt to provide an overall perspective, set of goals, and strategy that binds these together. It is impossible to tell what the U.S. goals and objectives are in technology transfer under this Convention, or the full extent of the U.S. commitment to international technology development and transfer. Yet, in signing and ratifying the Convention, the U.S. has committed our nation to:

> "Promote and cooperate in the development, application and diffusion, including transfer, of technologies, practices, and processes that control, reduce or prevent anthropogenic emissions of greenhouse gases not controlled by the Montreal Protocol in all relevant sectors, including the energy, transport, industry, agriculture, forestry and waste management sectors." (Article 4.1(c))

This commitment should lead us to make an explicit statement of purpose in our Plan, accompanied by an evaluation of our existing programs to identify gaps and specify how those are to be filled. The current text contains neither an overall evaluation of the programs, nor a review with respect to the six specific sectors singled out above.

Our program must be based on the private sector, with a strong program of incentives and assistance to encourage private sector projects that will reduce greenhouse gas emissions or aid developing countries in other ways related to global climate change. Governments can act as facilitators, but are not the primary actors in technology transfer. It is the private sector that develops the technologies, commercializes new, high efficiency products, builds and runs manufacturing facilities, designs and builds office buildings, homes and factories, and imports and exports goods in the world market

Our technology transfer program must be based on facilitating actions by hundreds or thousands of firms in the private sector. We can do that by providing a vision, setting goals, creating incentives, removing barriers, and facilitating private sector action. WWF offers five specific recommendations:

- The U.S. should set an ambitious, specific goal, such as having 1,000 private sector projects underway by 1996 in developing countries and countries whose economies are in transition. This would provide real focus for the government officials who are implementing the program. It would tend to concentrate their attention on real, concrete actions that would stimulate private sector activity. And the number of projects should be high enough to be a worthy goal--but even at this level it only amounts to 2 projects per year for each of the next four years for every developing or transitional country that signed the treaty
- The Administration should integrate the Action Plan goals and objectives into whatever reorganization is developed for the AID program.
- The U S. should actively seek and support meaningful changes to the Global Environmental Facility, which is the interim financing mechanism for technology assistance to developing countries under the treaty. WWF would

be happy to share our thoughts on that with you, but that is a subject for an entire additional session.

- The Administration should work actively to improve incentives and remove barriers to technology transfer and effective international private sector partnerships. For specific ideas, I would point to a report issued last May by the Office of Technology Assessment that identified the major barriers to effective technology transfer, and to the hearing record at that time which reflected the ideas of a number of organizations, including many in the private sector.
- As one specific example which WWF offered last Spring, assistance programs should be modified to provide seed money to establish "energy efficiency trust funds" in developing countries. Such monies could be used as revolving funds to overcome the high capital cost barrier of efficient technologies and the earnings could support continuing local staff capability That idea comes from our experience in conservation finance, specifically from debt-for-nature swaps Our experience has shown that the single greatest determinant of long-term success is securing funding to support local, independent staff to facilitate and oversee projects on a long-term basis.

(4) We should put the Action Plan on a "fast track", commit to publish it by August 1993, and call on other developed countries to do likewise The Plan should be the pacing activity for our national program to deal with the global warming threat, so we need it soon. Furthermore, the U.S. has an opportunity now to help accelerate other countries'

implementation activities by several months, or even as much as a year, but only if we commit ourselves in the next few weeks.

Virtually all governments that signed the Framework Convention at the Earth Summit last June agreed to support a "prompt start", so that implementation of key aspects of the treaty would not be delayed. The Action Plans are the first concrete implementing action that developed countries, in particular, are to take under the treaty. These Plans are to spell out the goals and programmatic steps that countries will take to achieve the substantive objectives of the Convention. To date, however, only the Netherlands and Germany have developed Plans that one might consider adequate. Other developed countries have made little, if any, progress on their plans and seem to be pacing themselves to the legal schedule in the Convention, which doesn't formally require the Plans until six months after the entry into force of the Convention. It is generally expected that the 50 ratifications required for entry into force will occur no earlier than the end of 1993, so the Plans would not be required until at least the summer of 1994 The U S has an opportunity to accelerate implementation activities by many of these countries by as much as a year if we can spur them to quicker action on their Action Plans by making a strong commitment ourselves

In closing. I will reiterate the overall thrust of our recommendations: the U.S National Action Plan must be revised to be a strategic blueprint for U.S. actions to combat global climate change, and it is needed soon.

National Action Plan for Global Climate Change
December 1992

Testimony of:

Business Council for a Sustainable Energy Future

John Hemphill
Executive Director

Respectfully Submitted to:

Subcommittee on Economic Policy, Trade
and Environment of the
House Foreign Affairs Committee

March 1, 1993

Comments of the
Business Council for a Sustainable Energy Future
Before the Subcommittee on Economic Policy, Trade and Environment
# of the House Foreign Affairs Committee

On the Draft National Action Plan for Global Climate Change
December 1992

John Hemphill
Executive Director

Introduction

The Business Council for a Sustainable Energy Future was chartered in December 1992. The Business Council is the first broad energy industry coalition that is committed to a comprehensive, forward-looking, and technology-based vision of our nation's energy future that will help prepare the U.S. economy for the challenges of the twenty-first century. Members of the Business Council comprise business leaders who all support increased reliance on energy efficiency, natural gas and renewable energy as the pillars of a more secure and sustainable energy strategy that will help strengthen the U.S. economy and clean up the environment. The Business Council is committed to working with policy makers at all levels of government, as well as citizen groups and the environmental community, to develop a sustainable energy future.

Summary

The Business Council for a Sustainable Energy Future commends the efforts of the U.S. Department of State in preparing the *National Action Plan for Global Climate Change* in accordance with the United Nations Framework Convention on Climate Change on behalf of the United States of America. The document is a comprehensive and thorough examination of current policies and programs that will help the U.S. achieve stabilization of greenhouse gas emissions.

The Business Council believes that in order for the *National Action Plan* to be more effective in cutting greenhouse gas emissions and setting an example for other countries to do the same, the document should examine the impact on future greenhouse gas emissions of programs not currently in place. This examination would include, but not be limited to, the impacts of a reprioritization of Federal energy RD&D spending away from carbon-intensive energy sources to less polluting ones, including energy efficiency, natural gas and renewable energy technologies. Government commitment, in conjunction with vigorous private-sector support, to developing and commercializing vital energy technologies such as solar photovoltaics, gas-based fuel cells and efficient lighting technologies, is a necessary component in achieving the nation's environmental, economic and energy independence goals. *An Alternative Energy Future*, a joint industry study sponsored by the Alliance to Save Energy, the American Gas Association and the Solar Energy Industries Association, shows how aggressive deployment of these technologies could reduce U.S. CO_2 emissions between 1990 and 2000 by almost 10% even without the benefit of the Btu tax and other initiatives in the President's economic package.

To achieve this result, however, the transportation sector must also be seriously addressed. The current draft plan virtually ignores the potential for reducing greenhouse gas emissions from the transportation sector. The transportation sector is one of the major energy-consuming sectors of the economy -- accounting for roughly 27 percent of total primary energy demand and the bulk of that demand (97 percent) is for petroleum. Any realistic plan to combat global climate change must examine the potential of programs such as alternative fuel vehicles, increased vehicle efficiency standards or improved mass transit systems, to reduce transportation greenhouse gas emissions.

It is also the opinion of the Business Council that the *National Action Plan* should have a much greater emphasis on mitigation strategies than on adaptation strategies. Adaptation to potential global climate change is a second best choice. The most cost-effective approach would be to prevent the behavior that adversely affects the global climate. In the current *National Action Plan*, a discussion of adaptive measures precedes that of mitigation actions. The implication is that the U.S. is more focused on adapting to global climate change than preventing it. Preventative measures, that make both economic and environmental sense, taken now will be less costly and more sustainable than adaptive measures taken in the future. The current action plan seems to give equal weight to both strategies when in reality, mitigation is the preferred option. Greater emphasis on global climate change mitigation would better underscore the country's commitment to address this issue.

The Business Council feels that in assessing mitigation strategies, the total fuel cycle must be considered in order to accurately reflect an option's impact on greenhouse gas emissions. Increased energy efficiency will be the foundation of a sustainable energy future. The current version of the *National Action Plan* recognizes the importance of greater end-use energy efficiency but fails to recognize the equal importance of achieving greater efficiency over the full energy trajectory. In considering options to reduce greenhouse gas emissions, it is essential to consider the emissions from the point of extraction to the end-use. Considering only end-use efficiencies will skew decisions towards applications that may be more efficient at the point of use but that are more polluting than other options on a fuel cycle basis. Therefore, failure to consider global climate change impacts on a total fuel cycle basis will result in an erroneous accounting of greenhouse gas emissions.

Finally, the Business Council believes that the *National Action Plan* does not adequately address the potential for helping to meet U S emissions reduction targets through joint implementation with other countries Many of the most cost-effective opportunities for reducing greenhouse gas emissions are in Eastern European and developing countries. The U.S. government should work in partnership with Business Council members and other organizations to identify those opportunities and develop joint programs for exploiting them with U S. products and technologies.

Attachment A

National Action Plan for Global Climate Change
December 1992

Testimony of:

Business Council for a Sustainable Energy Future

John Hemphill
Executive Director

Respectfully Submitted to:

Subcommittee on Economic Policy, Trade
and Environment of the
House Foreign Affairs Committee

Attachment A

Testimony of
Business Council for a Sustainable Energy Future
Before the Subcommittee on Economic Policy, Trade and Environment
of the House Foreign Affairs Committee
March 1, 1993

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1. Does the Plan meet the U.S.'s commitments under the Convention on Climate Change?

   Answer: The Plan technically fulfills the requirements of the Climate Convention. However, it should, at a minimum, identify additional measures the U.S. could consider in achieving stabilization of greenhouse gas emissions.

2. What are the Plan's strengths and weaknesses?

   Answer: Too narrow of a focus on current actions. The plan needs to be expanded to include possible further actions.

3. Should the Clinton Administration revise or re-submit this Plan?

   Answer: Yes, as soon as practicable.

4. Will there be positive economic benefits for American companies from

reducing greenhouse gas emissions?

Answer: The results of a joint study by the Alliance to Save Energy, the American Gas Association and the Solar Energy Industries Association, *An Alternative Energy Future*, show that a 12 percent reduction in carbon dioxide emissions by 2010 is achievable at a net economic benefit to the country. Such a future is premised on:

- No new government intervention in the marketplace;
- Elimination of state and Federal legislative and regulatory biases that discourage energy efficiency and encourage the use of carbon-intensive fuels;
- Continued improvement in efficiency of deployed energy technologies, resulting from competitive forces as well as from reallocated RD&D to natural gas, renewable and efficiency technologies;
- Full implementation of the National Appliance Energy Conservation Act (NAECA) and other efficiency standards; and
- Continued vigorous expansion of Integrated Resource Plans (IRPs)

The scenario depicted in the study has substantial positive economic impacts. It showed a 19 percent reduction in consumer energy bills, an improvement in the nation's balance of trade on the order of $50 to $60 billion and a net increase in domestic energy sector employment of 170,000 jobs. Other recent studies (American Council for an Energy-Efficient Economy) have estimated similar impacts from the expansion of activities such as aggressive deployment of high-efficiency energy technologies.

5. Will energy sector benefit from compliance with the Convention?

Answer: Yes, the U.S. Agency for International Development (AID) projects a world market for energy efficiency technologies and services alone at $8 to $17 billion annually. The U.S. is a major exporter of such technologies today and should continue to be so in the future.

GROWTH IN A GLOBAL ENVIRONMENT

GLOBAL CLIMATE COALITION

WRITTEN STATEMENT OF THE GLOBAL CLIMATE COALITION

before the

SUBCOMMITTEE ON ECONOMIC POLICY, TRADE AND ENVIRONMENT
COMMITTEE ON FOREIGN AFFAIRS
UNITED STATES HOUSE OF REPRESENTATIVES

WRITTEN STATEMENT OF THE GLOBAL CLIMATE COALITION

before the

SUBCOMMITTEE ON ECONOMIC POLICY, TRADE AND ENVIRONMENT
COMMITTEE ON FOREIGN AFFAIRS
UNITED STATES HOUSE OF REPRESENTATIVES

March 5, 1993

Mr. Chairman, Members of the Subcommittee:

I am Michael E. Baroody, Senior Vice-President of the National Association of Manufacturers and Chairman of the Board of the Global Climate Coalition. The Global Climate Coalition is a broad-based organization of business trade association and companies representing virtually all elements of United States industry, including the energy producing and energy consuming sectors. A list of our members is attached.

We believe that it is essential that the climate change issue be framed in the context of industrial competitiveness in a global economic environment. A strong and growing U.S. economy and a robust industrial sector are prerequisites to addressing domestic and international environmental challenges. Ill-considered policy responses to issues such as climate change, especially those that adversely affect the competitiveness of our nation's industries, would ultimately hamstring our ability to respond to pressing energy and environmental challenges. We are pleased to provide our written statement on the subject of the Subcommittee's March 1 hearing, "Global Climate Change: Adequacy of the National Action Plan."

The U.S. National Action Plan Fulfilled The Nation's Promise In The International Arena.

☐ The U.S. National Action Plan Was Issued Pursuant to the INC "Prompt Start" Resolution and President Bush's Promise, Not Pursuant to a Treaty Obligation.

In December 1991, at the fourth session of the Intergovernmental Negotiating Committee for a Framework Convention on Climate Change (INC) in Geneva, Switzerland, the U.S. announced that it would put forward a national climate action plan for public consideration within one year of signing a climate convention.[1] In concluding negotiations of the Convention in its fifth session in New York City in May 1992, the INC passed a "prompt start" resolution providing for "Interim arrangements" so that the INC could prepare for the first session of the Conference of the Parties, the Convention's governing board. Paragraph 5 of that resolution "[i]nvites States and regional economic integration organizations to communicate **as soon as feasible** to the head of the ad hoc secretariat information regarding measures consistent with the provisions of the Convention pending its entry into force." (Boldface emphasis added.)

Accordingly, when President Bush signed the Convention at Rio de Janeiro last June, he announced that the U.S. would present a national climate change action plan by the end of the year, and proposed that countries meet by January 1993 to present and review their plans.[2] This announcement was confirmed by the head of the U.S. delegation at Rio de Janeiro.[3] The U.S. National Action Plan for Global Climate Change (U.S. NAP) was prepared in response to Bush's commitment and presented at the INC session in Geneva, Switzerland, last December. Simultaneous with its communication to the INC Secretariat, the U.S. NAP was made available for public review and comment.[4] The Global Climate Coalition plans to file detailed comments on the national action plan by the March 8 deadline.

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[1] S. Rep. No. 55, 102d Cong., 2d Sess. 13 (1992); letter from Robert A. Reinstein to Richard D. Morgenstern (Dec. 4, 1992)(explaining the origins of the U.S. National Action Plan).

Moreover, correspondence from various U.S. officials before and after the release of the U.S. NAP last December confirmed that the plan was issued pursuant to the INC prompt start resolution and in response to Bush's promise.[5] In addition, when the U.S. NAP was introduced at the INC session in Geneva, Switzerland, last December, the head of the U.S. delegation indicated that it was the initial communication of the U.S. pursuant to the INC resolution and Bush's promise.

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[2] See 57 Fed. Reg. 58010, col. 2 (1992).

[3] Press briefing of William Reilly, Rio de Janeiro, Brazil (June 11, 1992).

[4] 57 Fed. Reg. 58010 (1992).

[5] Letter from Reinstein to Morgenstern, supra n.1.

☐ The Framework Convention on Climate Change Does Not Create a Binding Commitment on the U.S. To Stabilize Greenhouse Gas Emissions at 1990 Levels by 2000.

Under the Convention, each developed country party such as the U.S. agreed to:

> communicate, within six months of the entry into force of the Convention. . ., detailed information on its policies and measures referred to in subparagraph (a) above, as well as on its resulting projected anthropogenic emissions by sources and removal by sinks of greenhouse gases not controlled by the Montreal Protocol. . ., with the aim of returning individually or jointly to their 1990 levels these anthropogenic emissions of carbon dioxide and other greenhouse gases not controlled by the Montreal Protocol.

Art. 4, ¶ 2(b). Subparagraph (b) cross references subparagraph (a) of Art. 4, ¶2, which indicates that:

> the return by the end of the present decade to earlier levels of anthropogenic emissions of carbon dioxide and other greenhouse gases not controlled by the Montreal Protocol would contribute to. . .modification [of longer-term trends in anthropogenic emissions consistent with the objective of the Convention],. . .taking into account the differences in these Parties' starting points and approaches, economic structures and resource bases, the need to maintain strong and sustainable economic growth, available technologies and other individual circumstances. . . .

The U.S. position has always been that these agreements do not create binding targets or timetables for reductions of greenhouse gas emissions. As the Counsellor to the President for Domestic Policy wrote to the Chairman of the House Energy and Commerce

Committee, "there is nothing in any of the language which constitutes a commitment to a specific level of emissions at any time."[6] The counsellor stated:

> The word 'aim' [of subparagraph (b)] was carefully chosen, and it does not constitute a commitment, binding or otherwise. Nor does this sentence prescribe or imply any kind of timetable. . ..[B]y avoiding specific, definitive binding commitments we have put this nation in a position to respond more flexibly, and hopefully more fully, than would have otherwise been the case.[7]

In June 1992, at the opening for signature of the Convention at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro, Brazil, the statements of the UN Secretary-General, the INC Chairman and others confirmed this position.[8]

This position continued to be confirmed during the U.S. process for ratification of the Convention after UNCED. In transmitting the Convention to the President, the U.S. Department of State advised, "This subparagraph [2(b)] does not create a legally binding target."[9]

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[6] Letter from Clayton Yeutter to John D. Dingell (May 8, 1992)(presenting White House views on final text of the Convention).

[7] S. Rep. No. 55, _supra_ n.1, at 2.

[8] See, _e.g._, Statement of the United Nations Secretary-General, Rio de Janeiro, Brazil (June 4, 1992); Earth Summit Press Release, "Climate Convention Opens for Signature Today at UN Conference on Environment and Development," Rio de Janeiro, Brazil (June 4, 1992).

In favorably reporting the Convention to the full Senate for its advice and consent, the Senate Foreign Relations Committee stated, "This aim [of subparagraph 2(b)] is in the reporting section of article 4.2 and is not legally binding."[10] In a discussion that was clearly intended for the Conference of the Parties under the Convention and future White House administrations, the committee stated:

> **[A] decision by the Conference of the Parties to adopt targets and timetables would have to be submitted to the Senate for its advice and consent before the United States could deposit its instrument of ratification for such an agreement.**
>
> **The committee notes further that a decision by the executive branch to reinterpret the Convention to apply legally binding targets and timetables for reducing emissions of greenhouse gases to the United States would alter the "shared understanding" of the Convention between the Senate and the executive branch and would therefore require the Senate's advice and consent.**[11]

Thus, any decision by this Administration to alter the "shared understanding" of the Convention would require the advice and consent of the Senate.

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[9] Letter from Arnold Kanter to President George Bush (Aug. 28, 1992)(attaching article-by-article analysis of the Convention), as reprinted in Treaty Doc. No. 38, 102d Cong., 2d Sess. viii (1992).

[10] S. Rep. No. 55, supra n.1, at 2 (1992).

[11] Id. at 14 (emphasis added).

☐ There Is Neither an Obligation Nor a Compelling Reason To Modify the U.S. NAP at this Time.

As was explained previously, the U.S. NAP was issued pursuant to the INC prompt start resolution and Bush's promise. The U.S. is not obligated under the Convention to communicate any reports until six months after the treaty enters into force. See Art. 4, ¶ 2(b), and Art. 12, ¶ 5. The format for this and other formal communications will be considered by the INC as part of the preparation for the first session of the Conference of the Parties under the Convention.

Therefore, although the U.S. NAP could be modified at some future date, there is no obligation to do so until six months after the Convention enters into force and the INC has specified the format for communications required under Arts. 4 and 12. As of February 8, only 11 countries had ratified the Convention. Thirty-nine additional countries must ratify the Convention before it enters into force, and that is not likely to occur until possibly the end of this year or, more likely, late 1994. The U.S. NAP could be changed after that time to reflect the policies and measures then being taken by the U.S. to reduce greenhouse gas emissions.

In view of the Convention timetable and the desirability of allowing the Energy Policy Act and other laws and initiatives to be implemented (see following discussion), there is neither an obligation nor a compelling reason for the Administration to restructure the U.S. NAP at this time. However, the national action plan could be updated to reflect changes in U.S. laws and policies, as explained below. Any such modification should be coordinated with other countries' national action plans.

Numerous Governmental And Voluntary Programs Should Be Permitted To Take Effect Before Additional, Costly Programs Are Imposed On U.S. Industry.

☐ The Energy Policy Act and Other Laws and Initiatives Must Be Implemented.

-- Energy Policy Act of 1992

The U.S. NAP is very similar to its progenitor, the "U.S. Views on Global Climate Change," which was the paper issued by the U.S. State Department during the INC's fifth session in New York City in April-May 1992. In fact, the key numbers and tables in the U.S. NAP are virtually the same as the ones in the "U.S. Views" paper. The U.S. NAP states that this nation's mitigation actions will reduce domestic greenhouse gas emissions by 125-200 million metric tons of carbon (MMTC) equivalent by the year 2000, or between 7 and 11 percent of 1990 levels. The action plan explicitly concedes that projected net emissions of carbon equivalent in the year 2000 will be 1.4 to 6 percent above 1990 levels.

The Energy Policy Act was enacted in October 1992, and thus there was insufficient time to reflect the full implications of the new law in the December U.S. NAP. Granted, the Act incorporates to a large extent the programs of the National Energy Strategy (NES), which began to be implemented in early 1991, and some of these NES numbers are subsumed in the Act.[12] However, there was no systematic attempt made in the U.S. NAP to adjust the numbers specifically to reflect the effects of the new law.

It should be manifestly clear that implementation of the Act will have a significant impact on greenhouse gas emissions in the years and decades ahead. The U.S. NAP (at 73) identifies 11 titles of the Act that relate to global climate change. In addition, titles VII (Electricity), XIII (Coal)[13] and XX (General Provisions; Reduction of Oil Vulnerability)[14] also will reduce greenhouse gas emissions. The lion's share of reductions of greenhouse gas emissions are likely to result from titles I (Energy Efficiency), XIII (Coal) and XVI (Global Climate Change). In its report on H.R. 776, the House Energy and Commerce Committee stated:

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[12] The note to Table 16 of the U.S. NAP (at 93) indicates that the table reflects the efficiency standards of the Act. However, the numbers in Table 16 are identical to Table 1 of the "U.S. Views" paper (at 5). Similarly, Table 15 of the U.S. NAP (at 92) has the same numbers as Table 2 of the "U.S. Views" paper (at 6).

[13] See, e.g., §§ 1303, 1306, 1321 & 1331-1333.

[14] See, e.g., §§ 2021(e)(2) & 2025.

> **The Committee expects that, if fully implemented[,] H.R. 776 will result in a substantial reduction in U.S. greenhouse gas emissions relative to forecasted levels.** The bulk of these reductions result from the programs that will demonstrate and transfer advanced clean coal and renewable technologies abroad, and from the domestic energy efficiency and renewable energy initiatives. The provisions on electric utilities, alternative fuels and coalbed methane are also significant.[15]

-- Other laws

The U.S. NAP notes a number of other laws that should serve to reduce greenhouse gas emissions. The impacts of these laws on reducing such emissions do not appear to be taken into consideration or otherwise discussed in the U.S. NAP.

First, the U.S. NAP does not appear to fully take into account reductions in carbon resulting from implementation of the Clean Air Act Amendments of 1990. The U.S. Environmental Protection Agency (EPA) has estimated that implementation of the acid rain provisions alone will reduce carbon emissions by 16 million tons by the year 2000 and 19 million tons by 2010, resulting primarily from conservation due to higher electricity prices.[16]

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[15] H.R. Rep. No. 474, Pt. 1, 102d Cong., 2d Sess. 152 (1992)(emphasis added).

Second, the U.S. NAP (at 82 and 94) acknowledges the passage of the Intermodal Surface Transportation Efficiency Act of 1991, but does not appear to quantify its effects in reducing greenhouse gas emissions.

-- Other initiatives

Other government initiatives, primarily in the carbon uptake or sequestration area, should also offset carbon emissions and should be considered in the calculation of net emissions.

For example, Table 15 of the U.S. NAP (at 92) indicates that the carbon sink impact of the America the Beautiful and other forestry programs will be 5-9 MMTC by the year 2000. However, other analyses indicate that full implementation of the America the Beautiful tree planting program would sequester substantially more carbon by the year 2000.

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[16] A. Cristofaro, U.S. Environmental Protection Agency, "The Cost of Reducing Greenhouse Gas Emissions in the United States" 4 (Dec. 4, 1990). Other observers calculate a net annual CO_2 reduction of about 45 million tons over 1995-2005 due to the acid rain provisions. D. Dudek, A. LeBlanc & P. Miller, Environmental Defense Fund, "CO_2 and SO_2: Consistent Policy-Making in a Greenhouse" (1990).

In addition, the joint EPA-American Forests Cool Communities program provides for lessening of the urban heat island effect by the indirect evaporative benefits of trees, tree shading of homes and offices, and increase of the albedo of urban surfaces (lightening the color so that less solar radiation is absorbed). American Forests' Global ReLeaf program also is aimed at shading buildings. Through such shading, air conditioning needs can be reduced, less fossil fuel is consumed to generate electricity, and less CO_2 is emitted. The tree planting in these programs will also sequester CO_2 from the atmosphere. EPA has stated that the planting of 100 million urban trees and surface lightening could reduce U.S. CO_2 emissions by 1 percent, as well as sequestering carbon from the atmosphere.[17]

☐ Voluntary Industry Programs Will Reduce Greenhouse Gas Emissions Significantly.

-- Section 1605 of the Energy Policy Act

Title XVI of the Energy Policy Act sets forth a two-fold approach to the global climate change issue:

- Voluntary actions to reduce greenhouse gas emissions are encouraged.
- The government should analyze the important technical and

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[17] U.S. Environmental Protection Agency, "Cooling Our Communities -- A Guidebook on Tree Planting and Light-Colored Surfacing" (1992).

> policy issues[18] that will enable the U.S. to make wiser decisions on more dramatic and possibly higher cost actions, which should only be undertaken in the context of concerted international action.[19]

Section 1605 lists a number of emission reduction and carbon fixation measures that companies can undertake voluntarily: fuel switching, forest management practices, tree planting, use of renewables, manufacture or use of vehicles with reduced greenhouse gas emissions, appliance efficiency, energy efficiency, methane recovery, cogeneration, capture and recovery of chlorofluorocarbons, and power plant heat rate improvement. This list of voluntary actions is by no means exhaustive.

-- Environmental Protection Agency

EPA has been pursuing the voluntary approach to reduction of greenhouse gas emissions with its green programs for a number of years. Most of these, such as Green Lights and Energy Star computers, are well documented in the U.S. NAP. In addition, EPA and several manufacturers are reportedly working on a voluntary green program involving computer printers. We note that the Administration is seeking an additional $23 million in supplemental funding for FY 1993 (over and above the current funding level of $8 million) for EPA's green programs, and an additional $117 million for these programs through FY 1988.

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[18] See §§ 1601, 1602 & 1604 of the Act.

[19] _See_ H.R. Rep. No. 474, _supra_ n.15.

These programs are generally characterized in the U.S. NAP as "market-pull" programs, where mass-purchase initiatives and industry program coordination aimed at new technologies can help get products off the drawing board and into the marketplace.

The Act also encourages federal and voluntary incentives programs, in the section 1604 study provision. In addition, it provides for some specific tax credits in title XIX for programs that will result in reductions of greenhouse gas emissions.

Any Appropriate U.S. National Action Plan Should Include Several Key Concepts.

- ☐ The Global Climate Coalition Supports a Flexible, Balanced, Comprehensive and International Approach.

The U.S. NAP should include several key concepts. The Global Climate Coalition supports a flexible, balanced, comprehensive and international approach in responding to concerns related to the global climate change issue. Such an approach should be based on cost-effective, scientifically sound policies that are independently justifiable on their own grounds.

Moreover, both internationally and nationally governments should further enhance scientific and economic research to help resolve the many remaining uncertainties of global climate issues. As summarized in the 1990 First Assessment Report of Intergovernmental Panel on Climate Change (IPCC), these major uncertainties include: the magnitude, timing, rate and regional impacts of potential climate change; the effectiveness of specific response options in actually averting potential climate change; and the costs, effects on economic growth and other socioeconomic implications of specific response options. Furthermore, there is time to resolve the major scientific and economic uncertainties before taking actions that go beyond those that are cost effective, scientifically sound and independently justifiable on their own grounds.[20]

☐ A Comprehensive, Multilateral Response Is Needed.

A comprehensive, international approach to the global climate change issue is called for because greenhouse gas emissions are a global phenomenon and must be addressed by all countries. Rising levels of emissions from developing countries already far exceed emissions from industrial countries. In fact, then Senator Gore stated for the record last year:

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[20] A. Manne & R. Richels, "Reducing U.S. CO_2 Emissions -- The Value of Flexibility in Timing" (draft)(Nov. 1992), presented at "Global Energy Strategies," Ninth Annual Conference of the Center for Environmental Information, Washington, D.C. (Dec. 8-10, 1992).

> If the United States not only stabilizes emissions but reduces greenhouse gas emissions by 50 percent, and if every other industrial country also reduces greenhouse emissions by 50 percent, and the developing countries continue on their current path, then worldwide greenhouse gas emissions will, by the year 2030, increase by 250 percent.[21]

In the next century, the major emitters of greenhouse gases will be the emerging economies of the Commonwealth of Independent States (CIS) and Eastern Europe, China and centrally planned Asia, and other developing countries. See Figure 1. By 2050 these emerging economies will generate nearly 77 percent of the world's total anthropogenic greenhouse gas emissions.

Thus, any additional action on the global climate change issue must take into account the further negotiations of the INC and the work of the IPCC. Proceeding on a unilateral basis to stabilize or reduce greenhouse gas emissions, in the absence of an international agreement applicable to all nations emitting greenhouse gases and with an effective enforcement mechanism, could place U.S. industry at a competitive disadvantage in world markets and could harm our nation's economy.

The Global Climate Coalition supports the longstanding

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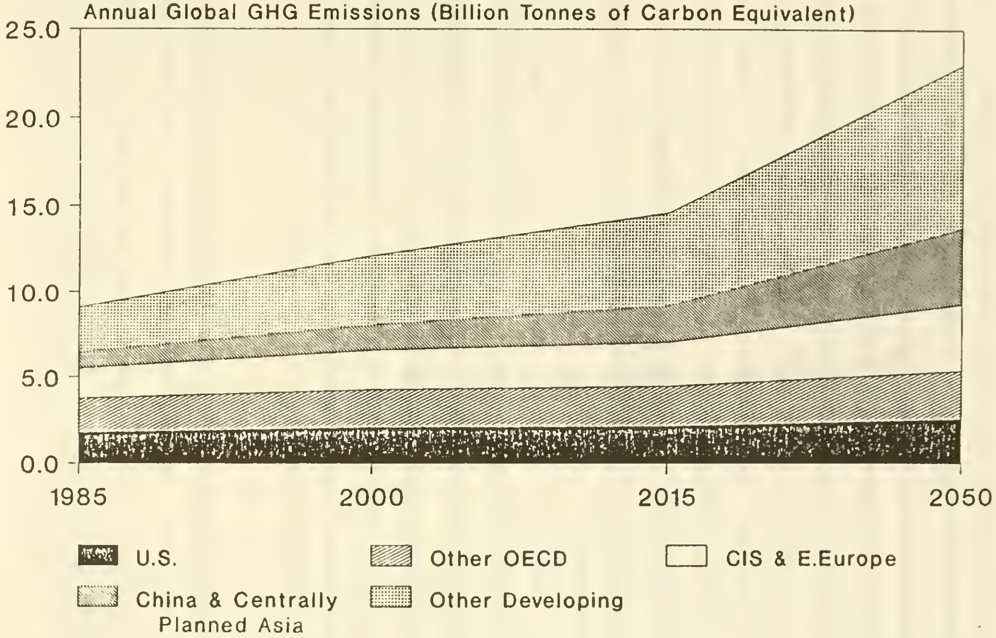
[21] 137 Cong. Rec. S4890 (daily ed. Apr. 7, 1992)(statement of Sen. Gore).

Figure 1
CONTRIBUTION TO ANNUAL GLOBAL GREENHOUSE GAS EMISSIONS



Note: Greenhouse Gases(GHG) include Carbon Dioxide, Methane, Cholorofluorocarbons(CFC-11,12) and Nitrous Oxide

Source: National Academy of Sciences, 1991 and U.S. Department of Energy, 1990 position of the U.S. in the INC negotiations, which is based on: 1) a comprehensive approach to addressing all greenhouse gases and their net emissions, taking into account all sources and sinks; and 2) flexible responses on a country-by-country basis. We do not believe that setting specific targets and timetables that specify emissions reductions or caps for a specific greenhouse gas from a specific industry would be appropriate policy. In addition, U.S. industry firmly believes that a crucial element not only of any international agreement on global climate change, but also of this country's response to the issue, must be technology cooperation in the international community.

The Global Climate Coalition has long supported a Technology Cooperation Corps initiative. This program holds the potential for significant environmental benefits due to U.S. industry involvement in the efforts of developing countries to constrain the growth of their greenhouse gas emissions. The U.S. NAP (at 112) briefly mentions this program.

Many observers have noted that research and development and investment that capitalizes on the use of more efficient technologies to reduce greenhouse gas emissions in developing countries could be more cost effective than some efficiency improvements in the U.S.[22] For example, it has been estimated that if even half of the world's expected expansion in coal utilization for power generation used U.S.-manufactured equipment, the market would be about $35 billion annually by the year 2010. Technology cooperation in the international community must be a key element of our national response to the global climate change issue.

Finally, impacts on international competitiveness must be considered by the government in any debate on national policy options. See Figure 2, which presents the results of a scenario in which there is a 20 percent reduction in 1990 carbon emissions for the Organization for Economic Cooperation and Development (OECD), CIS and Eastern Europe, with China and other emerging economies allowed to double their 1990 emissions. Under this scenario, the impact on China, CIS and the rest of the emerging economies would clearly exceed the ability of these fragile economies to cope with international carbon reductions or constraints. Losses in China alone would exceed 10 percent of its annual Gross Domestic Product (GDP) by the latter half of the 21st century. Moreover, note the impact of the carbon constraints on the U.S. vis-a-vis our trading partners in the OECD. The impacts on the U.S. are both faster

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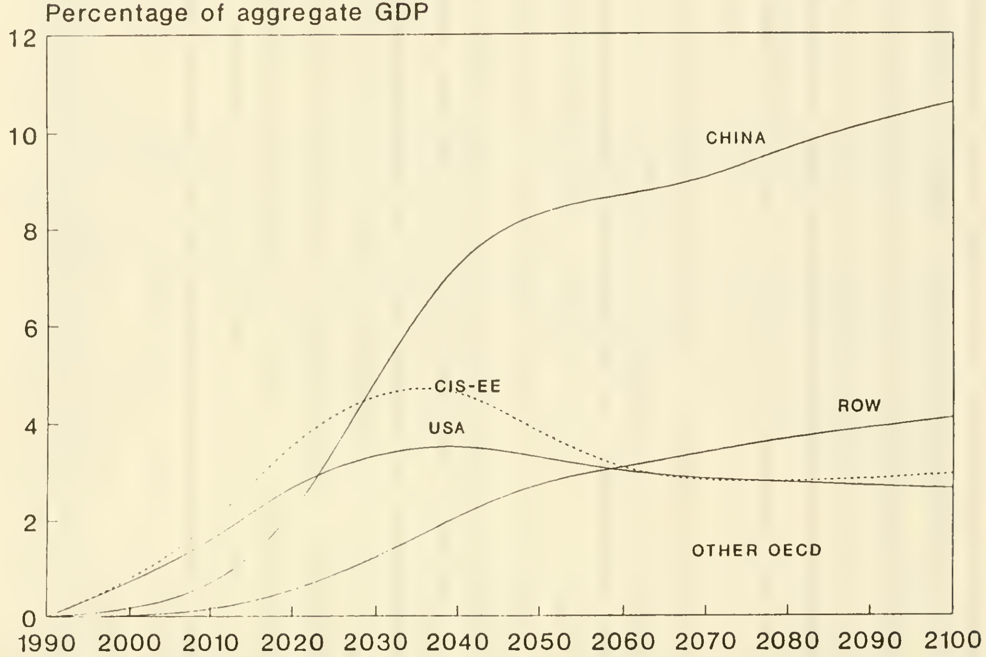
[22] O. Yu and E. Kinderman, "Capital Requirements, Energy Cost Savings and Global CO_2 Emission Reduction" (unpublished) (1991), cited in Electric Power Research Institute, "Global Climate Change Current Issues" 23, 27 (Aug. 1, 1991).

Figure 2

Losses Due to Carbon Limit



Source: Manne & Richels, 1990

than, and overall about twice as substantial as, the effects on OECD nations.

☐ Impacts of the U.S. National Action Plan on Economic Growth, Jobs, and International Trade and Competitiveness Must Be Assessed.

The U.S. NAP has appropriately focused its attention on the policies and measures already underway in the U.S. to reduce greenhouse gas emissions by the year 2000. The reductions that will result from implementation of the Energy Policy Act of 1992 and the Clean Air Act Amendments of 1990, as well as voluntary actions and other measures based on market conditions, should lead to economic efficiency and lower levels of emissions.

What the national action plan does not include is a detailed evaluation of the costs of these policies and measures and their impacts on the economy against the base case. Just as importantly, the U.S. NAP does not compare these costs and economic impacts to ones in other scenarios. Such analyses are important to the American public for two reasons.

First, it is important to demonstrate the significant difference in economic costs to society for many of the reduction actions associated with targets and timetables, as compared to the U.S. NAP. The actions already set in motion in the national action plan are quite costly, and those costs are neither highlighted nor detailed in a way that clearly shows the costs that already have been imposed on the U.S. economy. The absence of such a detailed discussion may leave the public with the impression that the U.S. NAP either is free or entails insignificant costs. Neither is the case.

Second, a description of the potential costs of more restrictive alternatives that the ones described in the U.S. NAP is important in educating the public on the additional costs of rigid targets and timetables or specific reduction levels. Moreover, such costs will have very real economic impacts. According to several recent studies,[23] restricting greenhouse gas emissions to 1988 levels could by 2010:

- Reduce GDP by 1.5 to 2 percent.
- Cause the loss of 500,000 jobs.
- Increase the fuel prices for electricity by 50-60 percent in the industrial sector of the U.S. economy.

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[23] U.S. Department of Energy, "The Economics of Long-Term Global Climate Change" (Sept. 1990); U.S. Department of Commerce, "The Economic Effects of Restrictions on Coal and Petroleum Fuels in Stationary Uses" (Apr. 1991); U.S. Department of Commerce, "Economic Effects of Using Carbon Taxes to Reduce Carbon Dioxide Emissions in Major OECD Countries" (Jan. 1992).

Conclusion

The Global Climate Coalition believes that command and control measures, such as targets and timetables, are unnecessary and should be avoided in any national action plan. The U.S. is the world leader in the global climate arena, as exemplified by the country's quick ratification of the Framework Convention and early release of the U.S. NAP, and by passage of the Clean Air Amendments of 1990 and the Energy Policy Act of 1992. Voluntary actions and legislatively mandated activities should be implemented before further costly, government programs are imposed on U.S. industry.

Moreover, the U.S. NAP should properly position the U.S. to fulfill its agreements under the Convention, particularly after implementation of the Energy Policy Act and other recent congressional and international mandates and initiatives. Such a result will be unprecedented in the industrial world, as even the few other countries that have also issued national plans -- such as the United Kingdom -- publicly concede that they cannot stabilize their greenhouse gas emissions by the year 2000 at 1990 levels.[24]

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[24] Under the plan of the U.K., its emissions will rise from 160 MMTC in 1990 to 170 MMTC in the year 2000, 183 MMTC in 2005 and 221 MMTC in 2020. U.K. Department of the Environment,

Attachment

GROWTH IN A GLOBAL ENVIRONMENT

GLOBAL CLIMATE COALITION

GLOBAL CLIMATE COALITION MEMBERSHIP

Board-Level (32)

American Cement Alliance
American Paper Institute
American Electric Power Service Corporation
American Mining Congress
American Iron & Steel Institute
American Petroleum Institute
Association of American Railroads
Association of International Automobile Manufacturers
Atlantic Richfield Company
Chemical Manufacturers Association
CSX Transportation, Inc.
Dow Chemical Company
Drummond Company
Du Pont Company
Duke Power Company
Duquesne Light Company
Edison Electric Institute
ELCON
Illinois Power Company
Kaiser Aluminum & Chemical Corporation
Motor Vehicle Manufacturers Association of the United States
National Association of Manufacturers
National Lime Association
National Coal Association
National Rural Electric Cooperatives Association
Ohio Edison
Phillips Petroleum Company
Process Gas Consumers
Texaco, Inc.
The Southern Company
U.S. Chamber of Commerce
Union Electric Company

General Membership (22)

Aluminum Association, Inc.
American Commercial Barge Line Co.
Amoco Corporation
Arizona Public Service Company
Armco, Inc.
Bethlehem Steel Corporation
BP America, Inc.
Burlington Northern Railroad
Carolina Power & Light
CONRAIL
Consumers Power
Eastman Kodak
LTV Steel Company, Inc.
Midland Enterprises
Nestle
Norfolk Southern
Pennsylvania Power & Light Company
Portland Cement Association
Railway Progess Institute
Shell Oil Company
Union Carbide Corporation
Union Pacific Railroad

TESTIMONY OF

Dr. Irving M. Mintzer
Center for Global Change
University of Maryland, College Park

Before the Subcommittee on Economic Policy, Trade and Environment
Committee on Foreign Affairs
U.S. House of Representatives

My name is Dr. Irving M. Mintzer. I am a Senior Research Scholar at the Center for Global Change, University of Maryland, College Park. The Center is an independent research unit of the University of Maryland, conducting policy-related research on issues affecting the development of the economy and the protection of the environment. I have been analyzing policy responses to the risks of rapid climate change and stratospheric ozone depletion for the last ten years. I have testified on these issues in the U.S. House and Senate, in the British Parliament, and in the European Parliament. I serve today as a member of the Scientific Working Group (WG I) of the Intergovernmental Panel on Climate Change (IPCC) and of the new Cross-cutting Issues Working Group (WG III) of the IPCC. I am a co-author of the IPCC 1992 Scenarios of future economic growth and greenhouse gas emissions and Senior Editor of the recently published volume ***Confronting Climate Change: Risks, Implications, and Responses*** (Cambridge University Press, 1992). For the last two years I have been an invited observer in the deliberations of the Intergovernmental Negotiating Committee for a Framework Convention on Climate Change (INC). I attended the UN Conference on Environment and Development (the Earth Summit) in Rio de Janeiro, Brazil in June 1992.

GLOBAL CLIMATE CHANGE: Do We Know Enough to Act Wisely?

During the last five years, the risks of rapid climate change have received increasing attention among scientists and policy makers, from the press, the public, non-governmental organizations, and responsible leaders in the business community. Research on global environmental change in general, and on the risks of rapid climate change in particular, has increased dramatically both in the United States and elsewhere. As a result of extensive international cooperation in this research, scientists are now certain of several things. We know that the average global surface temperature has increased by about 0.5-0.7° C during the last century and that the ambient concentrations of a suite of heat-trapping gases are increasing in the lower atmosphere as a result of anthropogenic emissions that significantly exceed natural removal rates. A strong consensus has emerged in the international scientific community that a continuing buildup of these gases will rapidly change both local weather and global climate, but the precise timing and distribution of these expected changes **cannot** now be forecast with certainty.

The United States today spends more than $1 billion per year to understand the implications of global environmental change. We spend more than any other country and finance approximately half of all the scientific research on these issues. The fruits of this research have dramatically enhanced our scientific understanding of the dynamics of the atmosphere and the mechanisms of climate change. The U.S. investments of the last decade have financed the development of improved computer models of the atmosphere that are capable of simulating some of the most important relationships between the atmosphere, the ocean, and the terrestrial biota.

These models are complex, sophisticated, and computationally intensive. They run on the largest supercomputers available today. And they give us a good idea of the main outlines of climate change that could occur if the current trend of greenhouse gas buildup continues unchecked. The Scientific Assessment Report of the IPCC indicates that, if these current trends continue, the world could warm by 2-5° C and average sea levels rise by 20-70 cm by the end of the next century. This may not seem like much of a difference--but a change in average surface temperature of only 1° C is all that separates today's climate from that of the Little Ice Age of the 14th to 17th centuries. In this medieval period, during cold snaps Scandinavians could walk across the Baltic from Sweden to Germany. A warming of 2° C from today's level would take the planet outside the range of anything that humans have experienced in the last 10,000 years while a warming of 5° C would push the climate system beyond the experiences of the last one million years. This does not mean that human beings could not survive the change--of course some of us would live through it. It just means that we have no written or historical record to turn back to and ask: What did people do last time? What helped to ease the transition? What made things worse.

Part of the reason that public attention has focused on problems of the atmosphere has been the widespread publicity given to a series of unusual and extreme weather events. These have included hurricanes in Florida and the Eastern Caribbean that destroyed whole towns, wind storms in the United Kingdom that uprooted trees several hundred years old, torrential rains in Arizona and storm surges in Bangladesh that caused extensive flooding and significant loss of life. Hurricanes, wind storms, droughts, floods, hot spells, and cold snaps are not new or unique; they have disrupted human life for millennia. Extreme weather events have occurred without warning and on no particular schedule. They are not caused by greenhouse gases--but rapid global warming due to the enhanced greenhouse effect could dramatically alter the patterns of upper atmospheric winds and ocean currents in ways which destabilize the atmosphere for decades to come. These changes in the physical behavior of the atmosphere and ocean may increase both the frequency and the severity of extreme weather events.

What the recent experience of extreme weather events has illustrated is how sensitive modern societies are to even small changes in the weather. These episodes have also showed that some of our institutions are not well positioned to respond to rapid changes in environmental conditions. Hurricane Andrew demonstrated that some traditional American building techniques (and traditional practices of building inspection) are inadequate to meet the challenges of extreme weather events -- like the hundred-year hurricane. Fortunately, very few Americans lost their lives in this terrible episode, but Hurricane Andrew nonetheless placed enormous stress on local institutions and on many average American families. While the loss of human life was limited, Hurricane Andrew created over $5 billion of economic losses, stressing school systems, water treatment facilities, and insurance companies across southern Florida.

By comparison, the destruction caused by extreme weather events in developing countries has been (and will be) even more severe. Relatively speaking, the damages caused by another hundred-year storm--Hurricane Hugo which struck two years earlier in Jamaica--were much more devastating: hundreds of lives were lost, more than a hundred thousand were displaced and economic damages exceeded more than 4[illegible] percent of the annual Gross National Product of the island. In both cases, local institutions were ill-prepared to deal with the local environmental damages or the dislocation of regional economies.

Scientists today understand the broad outlines of the global changes that would result from a continuation of the trend in emissions of greenhouse gases. On average, scientists expect that the intensity of the global hydrological cycle will intensify by about 3-7 percent with a buildup equivalent to doubling the pre-industrial concentration of carbon dioxide. But much is still uncertain. Most important, no one can now predict with confidence the precise distribution of regional impacts that will result from global warming. For example, our understanding of the global hydrological system is sufficiently poor that we cannot even say, for sure, which areas will become drier and which will be wetter. We do not now know whether the additional precipitation will follow traditional distributional patterns, will make old deserts bloom or will mean that the frequency of severe storms will increase dramatically.

UNCERTAINTY, NON-LINEARITY AND SURPRISES

Rapid climate change due to the enhanced greenhouse effect could increase the probability of extreme weather events occurring during the next several decades, adding significantly to the pressures facing human societies and natural ecosystems that are already under stress. No one can say with certainty that any of the specific weather anomalies that we have recently observed have been caused by the steadily increasing atmospheric concentrations of greenhouse gases. But as the climate system moves toward a new, warmer equilibrium state, we can expect that the turmoil caused by unsettled weather patterns will continue and even increase. Nonetheless, current scientific knowledge is insufficient to determine how, where, or when the effects of climate change will provoke additional experiences of extreme weather events in the future.

There are other important uncertainties as well. Scientists know that the forces that control local and regional climates reflect the interaction of a set of closely coupled, non-linear systems. As we alter the radiation balance of the atmosphere--the driving force that controls the interaction of these systems--we expect that some of the responses of these natural systems will be "surprises". Due to feedback mechanisms which are not fully understood today, at some point in the future we are likely to cross critical thresholds in the response functions of these systems--entering a regime in which a small additional injection of pollutants will produce a big change in the system's response.

Among the most important uncertainties are the responses of the terrestrial and marine biota to changes in temperature, precipitation, and partial pressure of greenhouse gases. In some cases, for example, economically important plant species have shown increased growth and improved water use efficiency. In other cases, food crops have been negatively affected by increases in temperature or carbon dioxide concentration. Some important grains may not produce the high yield levels we have come to expect--and to depend on in an era of increasing human populations Preliminary research indicates, for example, that the four most widely used strains of rice cultivated today could experience a decline in fertility of up to 90 percent when exposed to temperatures just 4 C higher than the ones we currently observe.

Other types of feedbacks may be of smaller immediate impact on humans but more critical to the rate of change in future climate. Among those that are still uncertain are the effects of increasing temperature on soil microorganisms and on subsurface deposits of methane gas. Warmer temperatures may increase the respiration of soil microorganisms, providing a strong positive feedback to the climate system that could rapidly increase the flux of carbon dioxide to the atmosphere in temperate regions. In the cold polar regions, where surface warming is likely to be amplified two to three times above the global average, enhanced warming could melt the permafrost in some areas and release large amounts of methane to the atmosphere. It is possible that these methane deposits--which have been trapped for thousands of years under the frozen soil as hydrated complexes--could be freely released to the atmosphere, enhancing the greenhouse effect. If all of the trapped methane were released, it could double the current carbon content of the Earth's atmosphere.

It is certain that temperature rise due to the enhanced greenhouse effect would not just occur on land, but would also affect the 86 percent of the world that is covered with water. Increases in sea surface temperature (combined with exposure to other anthropogenic pollutants) have been linked to large-scale starvation among the coral species that are the principal storm-defense of many island communities. In addition, recent epidemiological research suggests that rising sea surface temperatures in near-shore areas may have significantly altered the lifecycles of the pathogens that cause cholera--contributing to the dramatic rise in this disease seen in the last decade in Latin America.

The main message in all this is simple. Due to a rapidly expanding research effort the scientific community has learned much about the dynamics of climate change. Yet we still do not know enough to predict the regional impacts of global warming with certainty or to forecast the future pattern of extreme weather events. We do not now know what will trigger future non-linear episodes in the response of the climate system to small increases in the concentration of greenhouse gases. But we do have enough information to act wisely and to make prudent public policy choices that can manage future risks.

BUYING A LITTLE INSURANCE

Our position is similar to that of many parents with young children. They know that they and their children will be exposed to stress and disease in the environments in which they must live and work. They expect that at some unscheduled point, one or another member of the family will fall ill. But they cannot now know the timing or the severity of that future illness. They can ignore this possibility since they do not know **for sure** that one or more of them will become sick. Or they can take a few simple steps in advance to limit the risk. They can choose to follow a healthy diet, abstain from smoking, avoid drugs, forego excessive use of alcohol, and get regular exercise.

And to address the risks that cannot be avoided or minimized, they can invest in some basic insurance. A similar opportunity is available for our country and our economy.

We cannot now know what the effects of climate change due to the greenhouse effect will be on our economy and on our people. But we can take some steps to minimize the risks. We can reduce the likelihood of experiencing rapid climate change by reducing our national contribution to global emissions of these gases. And we can increase the resilience of American society and of international institutions to the effects of climate change that cannot be avoided by building up local institutions and strengthening local economies.

The key to a prudent response to the risks of rapid climate change lies in trusting our people and the free market. We must use the market to promote investment in industries that will increase the economic development of the country without contributing to a dramatic increase in the emissions of greenhouse gases. And we can make American society more resilient to the impacts of climate change by strengthening traditional institutions. In so doing, we can create new high-wage jobs at home and demonstrate international leadership abroad.

REVISING THE NATIONAL INACTION PLAN FOR CLIMATE CHANGE: Planning for a Stronger America

The National Action Plan submitted by the Bush Administration will not accomplish either of these goals. The Bush Climate Plan is not, in any true sense, an action plan to respond to the risks of rapid climate change. Although it does not violate the letter of the U.S. commitment under the Framework Convention on Climate Change, it clearly contravenes the intent of the new treaty. Reflecting what the country was already doing absent concerns about climate change or our obligations under the Framework Convention, the program proposed at the eleventh hour by the Bush Administration is a plan for national **inaction**.

The Bush Plan, introduced at the Sixth Session of the Intergovernmental Negotiating Committee, held in Geneva in December 1992, was a clear attempt to limit the options of the incoming Clinton Administration and to preempt the role of the new Administration in future negotiations on climate change. It was introduced without Congressional review and prior to a period of public comment. As a result, it is an unorganized collage of stale ideas and old programs, cobbled together at the last minute without any underlying strategic direction or plan. It will not serve the country or the planet well. This very conservative--one might even say retrograde--approach must be fundamentally re-worked. The Bush Plan precludes the United States from making a just and adequate contribution to the achievement of the objectives of the Convention outlined in Article I (United Nations, 1992). It does not assist the country or the world in stabilizing the concentration of greenhouse gases in the atmosphere at a level which will avoid significant anthropogenic disruption of the global climate system. As the world's largest emitter of greenhouse gases, we can--and indeed must--do better than this. The economic development of our country and the quality of our planetary environment depends on it

Nonetheless, the National Action Plan is not wholly without merit and should not be discarded en bloc. It is a useful foundation, an indicator of what a Business-As-Usual strategy might look like. The analysis that went into the preparation of this plan should be retained. It should be treated as an annex to a real National Action Plan, developed jointly by Congress and the Administration, and designed to strengthen the American economy while reinforcing traditional American values of thrift, stewardship, and smart business sense.

To achieve the complementary goals of strengthening the economy and protecting the environment, the new National Action Plan must embrace the spirit as well as the letter of the Convention signed at the Earth Summit last June. The U.S. must make a firm commitment to stabilize emissions of carbon dioxide and other greenhouse gases at their 1990 level and then begin to reduce them from this level before the beginning of the new century. To achieve these goals while making U.S. industry more competitive and the economy more energy efficient will take a dramatic assertion of U.S. leadership. The U.S. should re-enter the climate negotiations prepared to move aggressively toward reducing domestic emissions while building the basis for new partnerships between U.S. firms and their counterparts in the private sector of developing countries. Only in this way can we apply the best of American technology to reducing the risks of rapid climate change.

Building on the basis of the President's Economic Plan, the U.S. must use market mechanisms to increase the economic efficiency of energy use at home. But to demonstrate the leadership that our friends and allies are now looking for from Washington, we must go further still. We must make a commitment to introduce a set of energy efficiency measures, designated by the Secretary of Energy as cost-effective today, in all new leased or constructed space operated by and for the federal government.

We must reaffirm our faith in the American people by giving them true and complete information about the real price of energy. We must raise the price of gasoline to reflect the full economic and environmental costs of petroleum supply and use. I suggest an additional gasoline tax starting next month of $0.04 per gallon and increasing by $0.02 per gallon per month for the next four years. This should be complemented by a program to pay Americans to retire old polluting vehicles in exchange for a cash payment from the government. In addition, a program should be instituted to increase the excise tax on cars and light trucks that achieve less than the Corporate Average Fuel Economy standard in the year of their manufacture. One approach would charge the purchaser a tax of $1000 per mile per gallon (mpg) below the standard for the first 10 mpg, $2000 per mpg for vehicles that fall between 11 and 20 mpg below the standard, and $5000 per mpg for vehicles that fall between 21 and 30 mpg below the CAFE standard. The money raised by this excise tax would be divided between the old car "bounty" described above and a set of rebates for cars that achieve efficiency levels above the CAFE standard. For example, vehicles that are 1-10 mpg above the standard could receive $250 per mpg, vehicles that are 11-20 mpg above the standard might receive $500 per mpg, and vehicles more than 21 mpg above the standard might receive $750 per mpg. This type of "feebate" program was proposed by the Center for Global Change and adopted by the Maryland legislature but struck down by the courts because it violated federal laws. We should change the federal statute

The gasoline tax should be supplemented by an increased tax on electricity that reflects the carbon content of the fuels used to generate it. The electricity tax should be made revenue neutral by the adoption of a set of tax credits for investments made by individuals or firms that increase the efficiency of electricity end-use.

BUILDING NEW PARTNERSHIPS FOR A STRONGER ECONOMY

Although these domestic actions are necessary to demonstrate our commitment to a comprehensive strategy on climate change, they are not enough to achieve the goals we have set in the Framework Convention on Climate Change. The U.S. must take the lead at the international level as well. This Administration must promote an era of new partnerships between U.S. firms and their counterparts in developing countries. These partnerships and joint ventures must be directed toward the co-development of new technologies that can support the national development objectives of the receiving countries while minimizing long-term damage to the environment.

Energy supply and use is a key sector in which to promote such partnerships. Even today, U.S. technology in many areas of renewable energy systems and energy efficiency improvements leads the world. Many developing countries, already desperately short of reliable energy must expand both their supplies of energy and their efforts to increase energy efficiency in the coming decades. Renewable energy systems and energy efficiency technologies offer one important way to meet some of these energy demands while limiting the rate of growth in per capita emissions of greenhouse gases from developing countries

To facilitate new partnerships in the energy sector, the U.S. should build on the recent successful experience in this area on the part of the U.S. Agency for International Development. US AID has operated the Program to Accelerate the Commercialization of Energy Research (PACER) in India for the last three years. This successful program utilizes a revolving fund to encourage the development of new partnerships by providing the risk capital necessary to initiate the venture. When the venture leads to a commercial product, the initial cash influx is returned as would be any conventional loan. Programs of this type should be extended to other countries and to other regions. By promoting these new partnerships, facilitating the launching of joint ventures and the equitable sharing of the resulting economic rents, the U.S. government can promote a brand of environmental activism that is good for American firms as well as the global environment

Another important opportunity for promoting the goals of the Climate Convention lies in a drive to develop a new international network of Centers of Excellence on Renewable Energy Systems and Energy Efficiency Technologies. This new network, modeled in part on the successful Consultative Group on International Agricultural Research (CGIAR), would be built out of existing institutions, mostly in developing countries but with some participation in industrial countries as well. The network, with one institution in each region promoting the accelerated market development of each major renewable energy technology, would support institutional strengthening and capacity building in the developing world. The regional centers would act in each region as a fulcrum for the promotion of new partnerships. The centers would engage in market evaluation, contract liaison, and the identification of promising applications for renewables in the region. By conducting applied research, they would generate reliable data on the availability of renewable resources and maintain a directory of firms and institutions that could be competent partners in the development of new technologies The support of such a network is currently under consideration in the World Bank and in U.S. AID. These efforts should be encouraged by the Congress.

Beyond the support of regional centers of excellence to promote renewable energy systems and energy efficiency technologies, the Clinton Administration should support a general change in direction for the mainstream lending of the World Bank and the programs of the Global Environment Facility (GEF). In the case of the World Bank, the Administration should press for a greater emphasis on integrated resource planning and demand side management in the energy sector. It should require that every new power sector loan devote at least 20 percent of the proceeds to measures to increase energy efficiency and otherwise limit the environmental impacts of energy supply and use. In the case of the GEF, the new Administration should push for a broad interpretation of the incremental cost clause of the Climate Convention, providing significant support for institutional strengthening and capacity building activities in recipient countries. In general, the GEF should be urged to support development-oriented projects that have a significant benefit to the environment and not be limited to environmental projects that may have an incidental benefit for development. This orientation is necessary to assure the equitable distribution of the upcoming replenishment of the GEF and to maintain the enthusiastic participation of developing countries in the INC.

To demonstrate the commitment of this Administration to leadership on international economic development and the protection of the global environment, the President should prepare a major environmental address to be delivered this spring to the United Nations General Assembly. This speech should cover not just the risks of rapid climate change, but the full gamut of environmental issues that face the international community today. It should reaffirm the commitment made by the President during the fall campaign to stabilize U.S. emissions of carbon dioxide at the 1990 level--but it must go well beyond that easy step. It must position the U.S. as the world leader on the development of environmental technologies and the champion of those who would reduce environmental degradation in the developing world by promoting the status of women and eradicating poverty. A whole-hearted commitment by the U.S. to these goals will not only enhance our status in the world community, it will open up new markets for American businesses and help to save the global environment for our children.

CONCLUSIONS

In summary, the Clinton Administration must meet the challenge of U.S. commitments to the Climate Convention by completely re-working the U.S. National Action Plan. Using the old plan as an annex, the new plan should emphasize new and additional efforts in the U.S. to reduce our energy-related domestic emissions of greenhouse gases. It should also outline specific programs for increasing the resiliency of U.S. society to the types of weather and climate changes that might accompany a global warming due to the enhanced greenhouse effect. These should include a complete prohibition on subsidized timber sales, expanded efforts to protect and conserve the quality of

U.S. soils and forests, and measures to reduce the risk of damage to vulnerable U.S. coastal zones. In addition, the Administration should move aggressively to promote new partnerships between U.S. firms and their counterparts in developing countries to accelerate the co-development and deployment of renewable energy technologies and energy efficiency devices. It should encourage a shift in the composition of lending and aid programs to stress the development of these critical technologies. Perhaps most important, this Administration must end the institutional deception of the American people. We must have faith in the honesty and intelligence of average Americans to use honest market signals about the real price of energy. If we can stop lieing to the American people about energy--by making the price of fuels reflect the full economic and environmental cost of energy supply and use--we can build our economy on the basis of a sustainable energy future. This is the challenge of the climate issue for the Clinton Administration. If we can meet this challenge squarely today, we can build both a strong nation and a clean environment.

Additional Information from Mr. Lashof responding to question from Mr. Ballenger at pp. 64-65.

The average person exhales about 2 pounds of carbon dioxide per day. So 1000 people breathing for an hour would produce about 90 pounds of carbon dioxide. This is about the same amount of carbon dioxide that is produced by one person driving an average car (with a fuel economy of 20 miles per gallon) for 80 miles, say one round-trip between Washington and Baltimore. In fact, the average American produces 56 times as much carbon dioxide from fossil fuel consumption as from food consumption (which is released through breathing). Also, the carbon in food is recycled when plants remove carbon dioxide from the atmosphere as food is grown.

STATEMENT OF DANA ROHRABACHER, MEMBER OF CONGRESS

BEFORE THE

SUBCOMMITTEE ON ECONOMIC POLICY, TRADE AND ENVIRONMENT
OF THE
HOUSE COMMITTEE ON FOREIGN AFFAIRS

March 1, 1993

Mr. Chairman and Fellow Members of the Subcommittee:

It has come to my attention that some people are suggesting that, when the Bush Administration promulgated the U.S. National Action Plan concerning the issue of potential global climate change, commonly called the "USNAP," it did so in the dark of night in a last-minute effort to preempt the Clinton Administration on that important policy matter. That is a complete mischaracterization of what happened, and I want this Subcommittee's record to reflect the facts accurately.

By its terms, the United Nations Framework Convention on Climate Change does not enter into force -- that is, become legally binding -- until 90 days following its ratification by 50 nations. Only about 12 nations have ratified the Convention so far, and the United States was the first industrialized nation to do so. So, although more than 150 nations have signed the Convention, the further requirement of ratification means that the Convention likely will not enter into force until sometime in the spring of 1994.

Article 4, Paragraph 2 of the Convention, among other things, requires industrialized nations to adopt policies and measures to limit greenhouse gas emissions and to report thereon and on the projected results of such policies and measures. The report is to be furnished to the Conference of the Parties, the supreme body of the Convention, consisting of all parties to the Convention. However, the Conference of the Parties does not come into being until after the Convention enters into force.

The Convention was negotiated by an international body, established by the U.N. General Assembly, the Intergovernmental Negotiating Committee for a Framework Convention on Climate Change -- the INC. The INC recognized that, because of the ratification requirement, there necessarily would be delay in the industrialized nations' submitting their reports on climate change policies and measures pursuant to the mechanism established by the Convention. So, on May 9, 1992, the very day that it approved the text of the Convention, the INC adopted what was called a "prompt start resolution."

That resolution "invited" nations eligible to sign the Convention "to communicate as soon as feasible to the head of the secretariat information regarding measures consistent with the provisions of the Convention pending its entry into force." (emphasis added).

In my view, the prior Administration's publication of the USNAP in December 1992, at a meeting of the INC, was nothing other than our nation's honoring the INC's prompt start resolution.

But, there is more. During the course of negotiation of the Convention, the U.S. publicly committed to early publication of its national action plan concerning climate change. Indeed, at the "Earth Summit" in Rio, in June 1992, which was long before the election and even before Mr. Clinton was nominated, President Bush -- reportedly at the urging of EPA Administrator Bill Reilly -- called upon industrialized nations to come forth with their respective national action plans by the first of 1993.

This was an effective challenge to the European Community, which, although it had engaged in substantial political rhetoric about "stabilizing" its CO_2 emissions at 1990 levels by the year 2000, actually had no agreed plan for achieving its objective. And, I might add, it still does not.

Having publicly challenged other nations to put their national action plans on the table by the first of 1993, the Administration hardly could have avoided doing so itself. The last international occasion to do so, by that deadline, was the INC meeting in Geneva in December.

So, when we look at the facts, the prior Administration's publication of the USNAP not only was pursuant to the INC's prompt start resolution, but also made good on the public commitment of the President of the United States, made long before the election.

We also should recognize that the USNAP was developed as a result of an interagency deliberative process participated in by all relevant Executive Branch departments and agencies, including EPA and the Council on Environmental Quality.

Moreover, publication of the USNAP was accompanied by a December 8 Federal Register notice, which invited the public to comment on the USNAP. The comment period expires next week.

I shall look forward to being enlightened on these important issues not only by testimony of the witnesses selected for today's hearing, but by the public's comments that were invited by the prior Administration.

Testimony to the Foreign Affairs Committee, U.S. House of Representatives

March 9, 1993

Patrick J. Michaels
Associate Professor of Environmental Sciences
University of Virginia
Virginia State Climatologist

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This testimony does not represent any official view of the University of Virginia or the Commonwealth of Virginia, but rather is the personal testimony of Patrick J. Michaels, tendered under the traditional protection of academic freedom.

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Thank you for inviting my testimony on the problem of global warming and the enhanced greenhouse effect.

While this hearing is primarily concerned with policy, one must ask an important question before proceeding with that policy: *do the facts warrant any considerable expenditure to remediate global warming?* I believe that they do not; rather, the facts indicate that projections of the amount and effects of global warming that have been presented to the Congress of the United States have been based upon a forecast that is already failing.

Consequently, my testimony centers around disparities that have arisen between forecasts of global warming and actual observations. The implication is that the political process has intervened in a scientific issue before that science had matured.

Four years ago I testified to the Subcommitee on Energy and Power that the politically popular vision of global warming caused by an enhanced greenhouse effect--ecological and agricultural chaos caused by dramatic daytime heating, and meters of sea level rise--was flawed. I emphasized that the observed data on climatic change had, even then, indicated that projected warming had not occurred in the regions in which it was forecast to be most pronounced. Further, I pointed out that one very reliable set of data (though limited to the coterminous United States) indicated that almost all warming had taken place at night, which is a benign climatic change.

Since my original testimony, I have on several occasions been asked to speak before House and Senate Committees on this subject. In each succeeding testimonial, additional evidence has been presented that bolsters my original view. I believe it is reasonable to state that my original view, once thought of as heretical by some in the Congress, is now becoming a mainstream scientific synthesis of the global warming problem.

Science proceeds by entertaining hypotheses that can be supported by observed data. In the case of global warming, the most refined hypotheses we have are known collectively as General Circulation Climate Models (GCMs). A typical example of this type of calculation, taken from Schlesinger and Mitchell (1986) is shown in Figure 1. The salient features are the projection of overall average warming and the concentration of that warming in the highest latitudes (the polar regions) of the Northern Hemisphere.

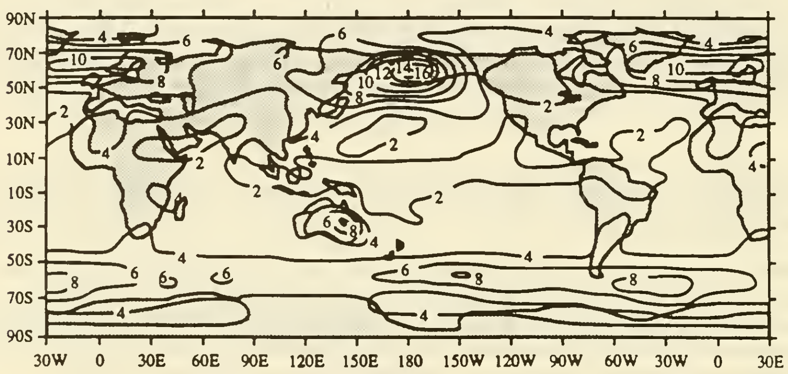


Figure 1. Change in mean temperature calculated for doubling atmospheric carbon dioxide, December-February (Northern Hemisphere Winter). These projections are typical of those of the mid-1980s GCMs.

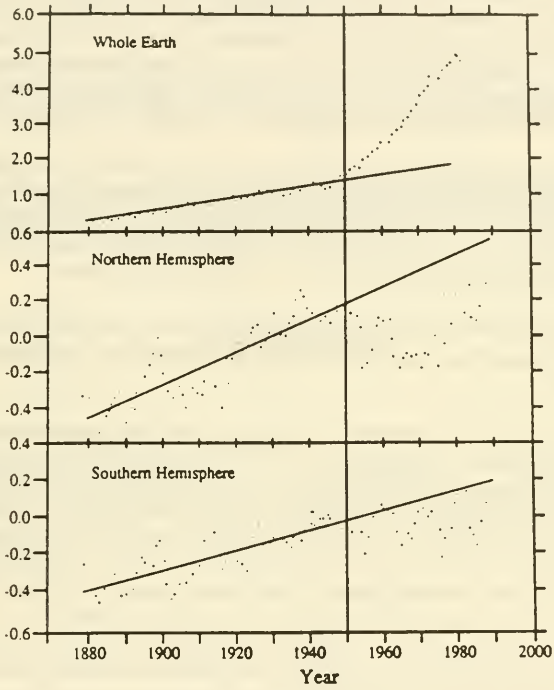
Together, the mean equilibrium warming predicted by the mid-1980's generation of these models for an effective doubling of atmospheric carbon dioxide (CO_2) was 4.2°C. According to data presented on page 246 of the 1990 report of the United Nations *Intergovernmental Panel on Climate Change*, the earth's mean temperature has never been on target for that projection in the last half-century.

The observed data on global warming therefore have consistently argued that the mean projections of warming were overestimated, both in magnitude, and in societal and ecological effect.

Following are some examples of the differences between forecasts and reality that have arisen:

GCM hypotheses indicate that the Northern Hemisphere should warm more rapidly than the Southern Hemisphere, because land (which predominates in our hemisphere) heats faster than water. Has this been the case?

The top portion of Figure 2 (Idso and Balling, 1991) is a plot of net carbon emissions. This actually underestimates the greenhouse effect enhancement because postwar increases in



Top: Global carbon emissions.
Middle: Northern Hemisphere ground-based temperatures.
Bottom: Southern Hemisphere ground-based temperatures.

GCMs predict that Northern Hemisphere should warm first and fastest. In fact, the Northern Hemisphere *stopped* warming at the rate it *was* warming as the greenhouse enhancement became important.

other greenhouse gases are not included. Nonetheless, the dramatic change after World War II is evident.

The middle graph is the ENSO-corrected Northern Hemisphere ground-based temperature history of Jones et. al., published by the U. S. Department of Energy. A search of the scientific reference, *The Citation Index*, indicates that scientists refer to their ground-based temperature histories more than to any others. An objective trend line has been placed through the data from when the record begins in 1880 to when the greenhouse enhancement becomes pronounced, and that trend is continued to 1990. *Every temperature reading after the greenhouse effect begins its dramatic rise is below the warming trend established before it was enhanced.* The net warming in our hemisphere since 1935 is statistically indistinguishable from *zero*. The Southern Hemisphere continues to warm, although at a somewhat slower pace than it did prior to the greenhouse enhancement.

It is doubtless that some of the warming at the end of these ground-based histories results from increasing urbanization around weather stations rather than true global warming. In fact, if one compares NASA satellite-sensed temperatures since the platforms became operational in 1979 to the ground based records, it is apparent that the satellite sees none of the southern hemisphere warming trend that is in the ground-based record.

Figure 3 details the satellite records, which are now in their 15th year. They have been monitoring global temperature during the period of the most rapid enhancement of the greenhouse effect.

It is apparent that they find no warming. Further, the brief, but sharp cooling from the 1991 volcano Mt. Pinatubo is very evident in the Northern Hemisphere record. While some have stated that a correct prediction of cooling from Mt. Pinatubo would indicate an analogous understanding of global warming, in fact that is not the case. A volcano scatters sunlight and increases atmospheric turbidity, and the concept of what happens to the daytime temperature when the sun goes behind a cloud is not hard to appreciate or forecast. The results of a greenhouse enhancement are much more difficult to comprehend, and in fact the data forces one to conclude that they have been misapprehended.

Rather, the obvious signature of Mt. Pinatubo in the satellite data indicates that the satellite *data* (rather than the computer *forecasts*) on global temperatures are correct. *There is simply no net warming observed in this record.*

In addition, the satellite finds no warming whatsoever in the high latitudes of the Northern Hemisphere, which is the region projected to warm the most. This finding is corroborated by a recent analysis of military records over the same region (Kahl, 1993). Statements that this is consistent with forecasts (See *Science News*, 1/28/93) are simply in error, as shown by Figure 4.

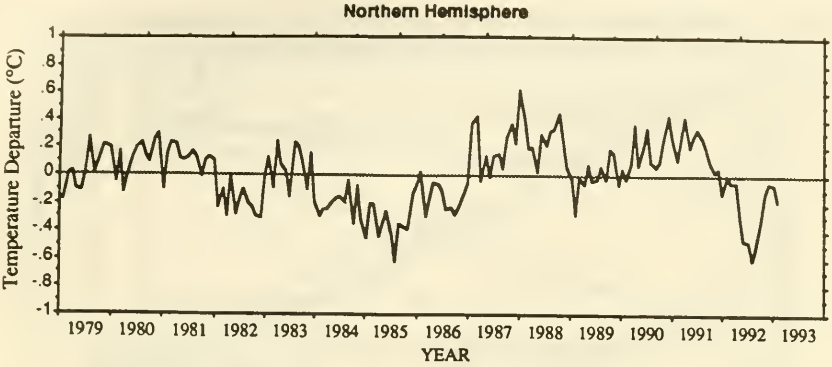


Figure 4a. Mean Northern Hemisphere temperature as measured by satellite (Christy, 1993). The accuracy of this record is thought to be ±0.01°C. The cooling signature of Mt. Pinatubo is evident, attesting to the reliability of this record.

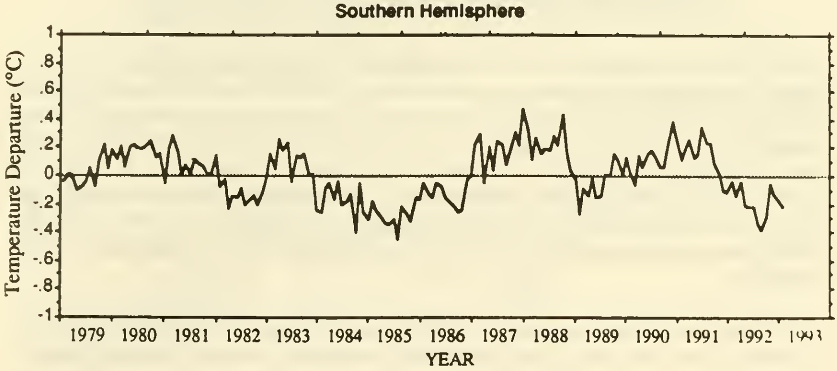


Figure 4b. Mean Southern Hemisphere temperature measured from satellite.

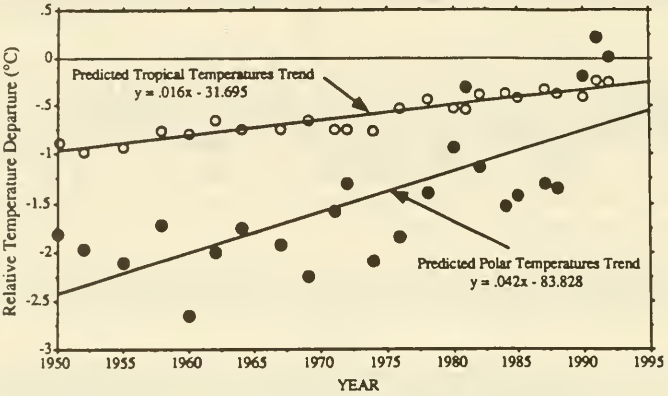
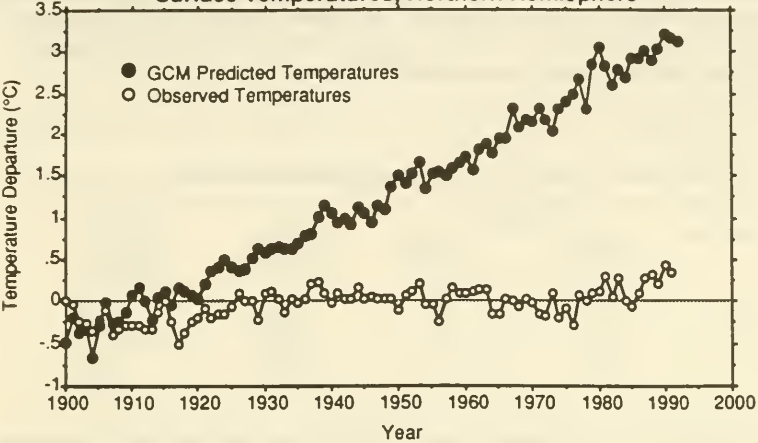


Figure 4. Warming predicted to have already occurred by the NOAA/GFDL GCM in north polar and tropical regions. It is clear that polar regions were predicted to warm at a rapid rate; in fact there has been no warming observed during this period.

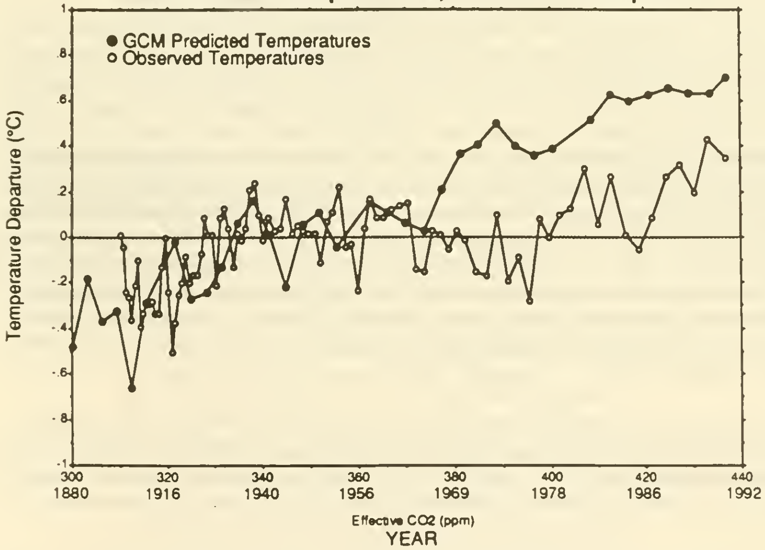
Figures 4 and 5 are calculated from a more sophisticated climate model--one in which the oceans and atmosphere interact in a more realistic fashion than in the earlier GCMs (Manabe et al., 1991). In this version, the increase in greenhouse gases is also treated more realistically. The top line in Figure 5 is the predicted temperature, and the bottom is the observed ground-based temperature record of the Northern Hemisphere. It should be eminently clear that our scientific understanding of the enhanced greenhouse is simply not commensurate with any expensive policy. Note that the observed temperatures are *not* the satellite measurements and therefore the warming at the end of the observed record may be exaggerated.

We often read that GCMs are capable of reproducing the broad features of climate but not the details. In fact, one can test this hypothesis by statistically defining the major features of climate and then comparing the behavior projected by GCMs over the last 100 years to what has been observed.

Table 1 details the results of such an analysis; it was prescreened by a peer review board and then presented at the American Meteorological Society's annual meeting in Anaheim California in January, 1993 (Michaels et al. 1993).



Comparison of GFDL Transient Model and Observed Mean Surface Temperatures, Northern Hemisphere



Comparison of GFDL Transient Model and Observed Mean Surface Temperatures, Northern Hemisphere

Figure 5. Model-calculated and observed temperatures for the Northern Hemisphere. Top: 100 year run with CO_2 increasing by 1%/year; Bottom: Model run with the observed change in CO_2, stretched from 34 model years to 100 years (Michaels et al., 1993). The true error lies approximately midway between these two plots; in any case, it is clear that these predictions have failed.

The Table below details the statistical correspondence between the most important patterns of observed climate and projections made for their behavior over the period of increase in the greenhouse effect. The results are as bad as they seem: The overall correspondence is statistically indistinguishable from zero. In many cases, the GCM actually predicts behavior that is mathematically opposite to what has occurred.

Explained Variance (%) Between Observed Temperature and GCM-Calculated Components

COMPONENT	WINTER NORTHERN	SUMMER NORTHERN	WINTER SOUTHERN	SUMMER SOUTHERN
1	0.0•	**21.0†**	0.0•	0.0•
2	7.1†	0.0•	0.0•	5.9
3	0.1	0.0•	0.2	0.0•
4	0.0	9.4†	0.0•	6.1

Values in outline are significantly different from zero at the .05 level for the model sample size. Zeros followed by asterisks are actually negative correlations, which would imply a negative skill forecast. Underlined values are "noise vs. noise" comparisons in which neither the observed data nor the model have any significant trend. Values followed by "†" indicate patterns in which nonzero trends were statistically similar between models and observations.

The trend for night (rather than day) warming, that I testified to on six previous occasions before Congress, now appears to be a worldwide phenomenon, rather than simply being confined to the United States. The accompanying table (Michaels and Stooksbury, 1992) details day/night and seasonal temperature changes around the Northern Hemisphere landmasses on a 100-year trended basis. Summer high temperatures--the ones most responsible for negative agricultural scenarios--have declined across the hemisphere which produces most of the world's food. Again, *atmospheric behavior appears to be opposite to that which has been forecast.* Winter night temperatures have risen dramatically. These figures are given in Table 2.

One hypothesis that has been tendered is that warming is being retarded, or inordinately channeled into the night (and therefore the winter, when nights are longer) because other industrial emissions, such as the sulfates that are associated with acid rain, are increasing the cloudiness of our hemisphere and therefore cooling the days while the nights warm. If this were true, then the effect would tend to confine itself to lower elevations (where the industrial emissions flow), and to the Northern Hemisphere, because the emissions do not reside long enough in the atmosphere to be transported very far south.

TABLE 2

Area-Weighted Temperature Aggregate: U.S., Former Soviet Union, Mainland China

TEMPERATURE TRENDS (°C/100 YEARS)

SEASON	DAY	NIGHT
WINTER	+0.6	+1.8
SUMMER	-0.4	+0.4
ANNUAL	+0.05	+1.1

In fact, the data argue that sulfates are inadequate to explain observed changes. Figure 6 is a very reliable climate record from the Pic du Midi observatory, high above timberline in the Pyrenees (Bucher and Dessens, 1991) , and above the layer containing most of the sulfate aerosol. The decline in day temperature and increase in night temperature is obvious. Cloudiness is also increasing and the daily temperature range is declining (this should occur as nights warm more than the days) in Australia (Jones, 1991), where the density of sulfate aerosols is approximately two orders of magnitude less than that in eastern North America or western Europe. In Australia, it is thought that the enhanced greenhouse operates less fettered by extraneous interference, and there, too, night warming has been much greater than that observed in the day.

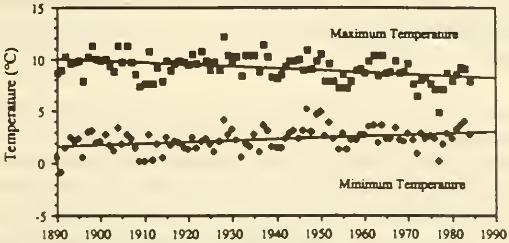


Figure 6. Day and night temperatures at Pic du Midi observatory. See text for details.

In summary, here is what the data tell us. Concurrent with an enhancement of the earth's natural greenhouse that is equivalent to proceeding half-way to doubling the background CO_2 concentration, we have observed the following:

1) A warming that has been consistently beneath forecast projections for the last 50 years,

2) A warming in which the hemisphere that should suffer the most in fact shows no significant change in the last 55 years,

3) A warming which is confined primarily to nights and winter, therefore lengthening the growing season, and

4) A lack of summer daytime warming, which precludes negative effects on agriculture and melt large areas of high-latitude land ice.

If these observations were to continue (and, if they are the response to an enhanced greenhouse, that would likely be the case) then nature would have to completely change its course in order to bring us to the deleterious changes feared by many.

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These observations are tendered to demonstrate the remarkable disparity between forecasts of deleterious climatic change and what has been observed. The former argues for economically stringent intervention, while the latter provides absolutely no basis for the former.

How did such a disparity between policy and science arise, and how can this be avoided in the future?

What has happened with the issue of global warming is that the political process intervened before the resolution of the normal and creative tension that exists in science between "models" (hypotheses, or forecasts) and "facts".

The issue became prematurely politicized in part because several elected officials had seized upon it without a proper appreciation of this tension and its need for resolution before any policy should be enacted.

Another process was also a cause: the fact that virtually all funding for basic research in the environment is appropriated by the Congress of the United States. It is therefore impossible not to politicize science, especially when Members have promoted the issue of global warming as one requiring national and international political activity. For all of his good intentions, the Vice President of the United States has been a central figure in this process. His oversight of the National Science Foundation and the National Aeronautics and Space Administration--two of the lead agencies in the study of global warming--would make it very difficult for Agency officials to argue before Congress that in fact the data indicate that global warming is a minor issue. This point of view is at considerable variance with one so eloquently expressed by the Vice President in his recent book.

One solution to this dilemma would be to encourage industry--which maintains its own perspective as surely as does the federal government--to become more involved in basic research. Specifically, I would proposed advanced tax credits for industry support of science, and a concomitant and equal reduction of federal support. This would keep support at its current level while broadening the perspectives from which that support emanates and also reducing the federal deficit. The final result is that scientists would be freer to choose from a range of funding viewpoints--something that is obviously restricted when control of science funding is maintained by the Congress.

Because of the premature politicization of this issue, considerable pressure has already been exerted to act precipitously on the subject of global warming, and with great potential expense. I hope that you will now see that such a policy is not commensurate with the state of science, and that this disparity can only be remedied by an enhanced research effort supported both by industry and government.

Thank you for soliciting my testimony.

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